

The Mining Journal

Established 1835

Railway & Commercial Gazette

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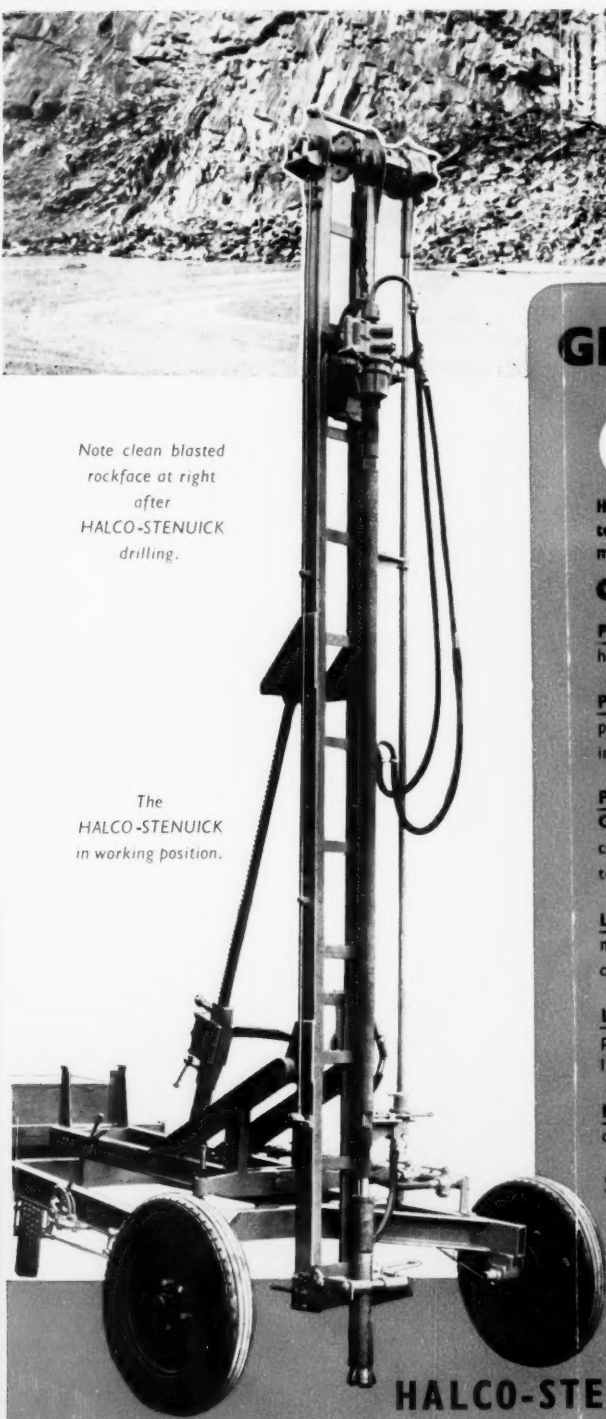
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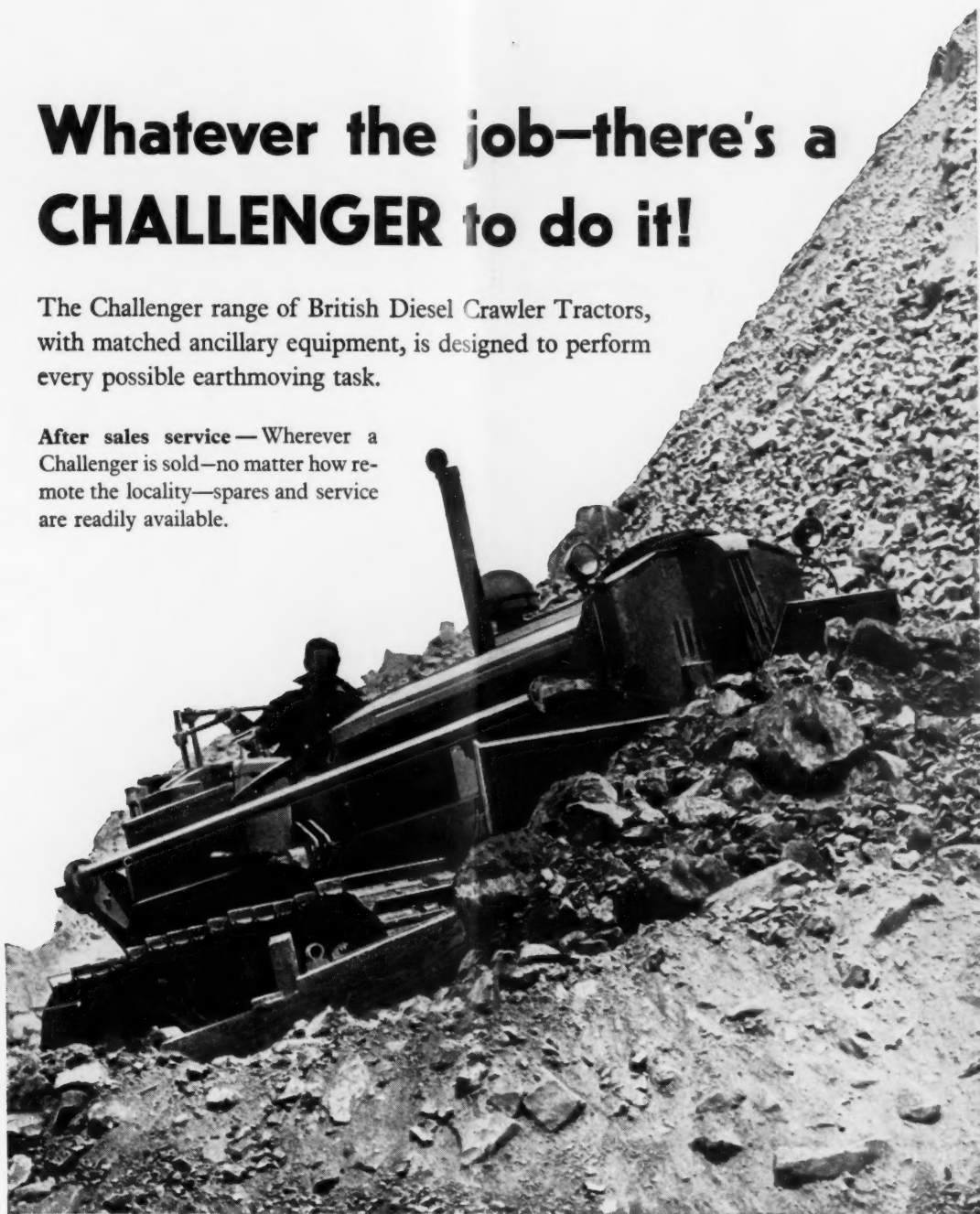
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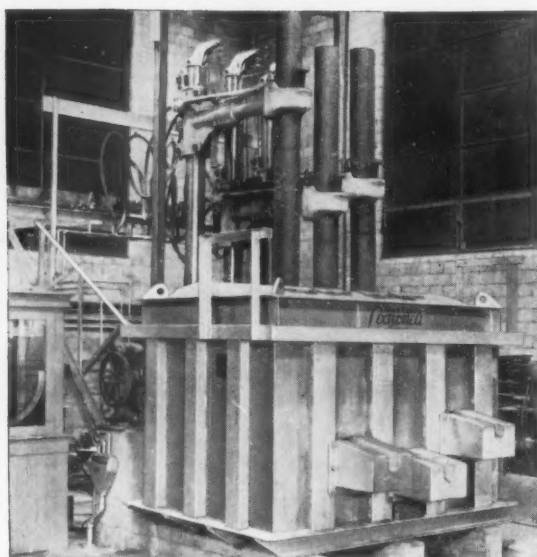
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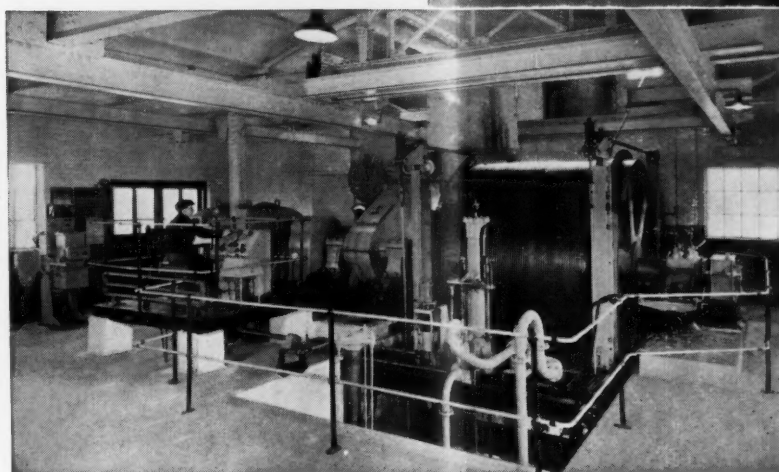
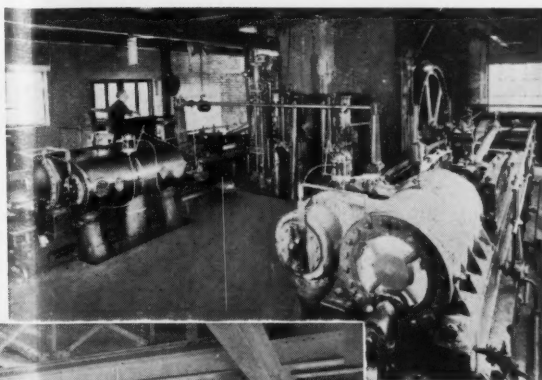
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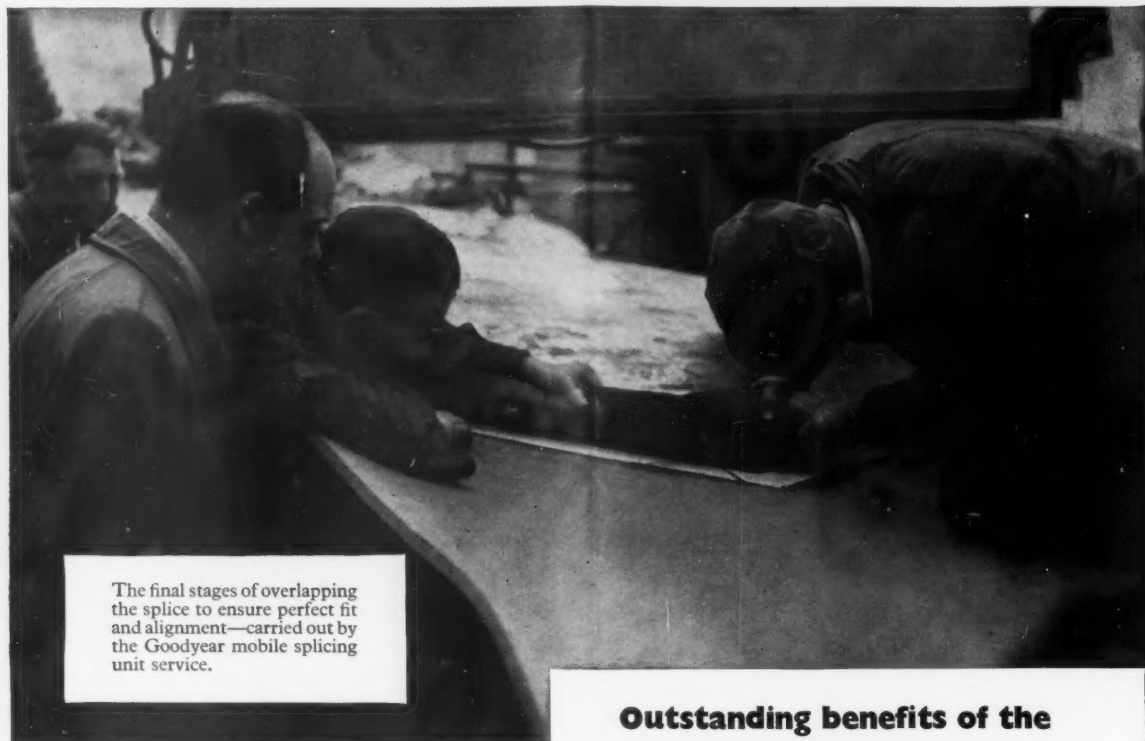
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Established 1835

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CONTENTS

Notes and Comments	703
From Our South African Correspondent	705
Developments in Titanium Metallurgy	706
B.O.M.A. on Graduate Recruitment	707
Airborne Exploration for Uranium	708
Current Mining Practice at West Rand Consolidated	709
Large Crusher for U.K. Quarrying Industry	710
Machinery and Equipment	711
Metals, Minerals and Alloys	712
The Mining Markets	714

Company News and Views	715
Company Meetings and Announcements	718
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NOTES AND COMMENTS

American Aid for South-East Asia

When Mr. Harold Stassen last month flew the kite of a Stassen Plan for Asia, the immediate reaction of some observers was that it would not long stay aloft. Cynics were quick to point out that the Foreign Operations Administration, of which Mr. Stassen is director and which would presumably administer the plan, is due to close down on June 30 next; to them the scheme was intended to rescue Mr. Stassen from eclipse as much as to rescue Asia from Communism. Furthermore, the announcement of the plan followed hard on requests from the finance ministers of 21 American states for more United States capital for South America and from Chile, Brazil and Argentina for a Latin American Finance Corporation which would, of course, be heavily supported by the United States.

Latin America is a much more attractive field for United States investment as the area pattern of private American foreign investment clearly shows; it has the security advantage over Asia of much greater proximity; and it possesses fairly easily exploitable mineral wealth which would satisfy the strategic considerations of American economic policy. Furthermore, Mr. Humphrey, secretary of the Treasury, early showed his opposition to Mr. Stassen's new foreign aid programme just as the old ones are tailing off. Mr. Humphrey has recently been forced to admit that the budget cannot be balanced in 1956 and is sensitive to Democratic charges that the Republicans' election promise to balance the budget has been proved dishonest.

The full consequences of Mr. Stassen's kite will probably not be known till the 84th Congress assembles, but it is already clear that it has met general Presidential approval. The Council of Foreign Economic Policy which was established last week would not have been called into being if Mr. Stassen's plan was being ignored, although this in itself is no guarantee that F.O.A. will survive in its present form, or perhaps even at all.

The matter is complicated by the unconcealed wish of the Administration to associate European countries with any new Asian aid programme. The Administration could not

afford to be rebuffed by European states in this matter and it is therefore probable that informal talks are now being held to ensure that at least the broad outlines of any future American programme would be acceptable to European states expected to support it. This is a delicate matter. A ready made organization is at hand in the Colombo Plan but it is an extremely flexible—not to say loose—affair which is one reason for its popularity in South East Asia. Whether the Colombo organization would be considered by Congress suitable for administering a Stassen Plan is by no means certain.

How far the Stassen Plan, if implemented, can serve the purpose of the American materials procurement policy or increased mineral developments will not be clear till the plan is published, but it is fairly evident that it can do this only incidentally. In the first place, the Stassen Plan is primarily and unashamed a cold war weapon—an attempt to make democratic enterprise appear more attractive than Communism. It would, therefore, still be justified if South East Asia had in fact no mineral resources at all. Secondly, to the extent that Europe will be associated with the plan it can hardly be made to serve directly the cause of American materials procurement. Thirdly, the Americans have never disguised their view that, though it is important to save South East Asia from Communism, it is not an area that can be relied on to supply materials in time of war: atomic war may make this true of all areas, it does not falsify it in respect of Asia. Fourthly, such rumours (and at this stage of the plan's development some rumours are certainly inspired) as have spread abroad have mentioned only development of electric power, transport and distribution, consumer goods industries and electric power. And, finally, it is important that the plan should not appear to have an ulterior motive and that it should not arouse the condemnation of "exploitation" from even the most ardent nationalist.

Having said all this, it is necessary only to add that minerals are an important part of South East Asian wealth and it does not make sense to consider development of the area without development of these industries. This, however, is likely to be for private firms to undertake prob-

ably in association with native interests. It is to be hoped that South East Asia will see that its duty must be to provide an economic climate conducive to foreign investment.

Recruitment of Coal Mining Engineers

The shortage of qualified young mining engineers has been commented upon in previous issues of *The Mining Journal* from the point of view of recruitment to the metaliferous mining industry. That this shortage also exists in coal mining has long been recognized by the National Coal Board, which in 1948 estimated requirements of professional engineers at about 200 per year. Accordingly the Board instituted a university scholarship scheme open to candidates fresh from school and young men already in the industry.

One hundred such scholarships have been made available each year but there has not been a year wherein 100 suitable candidates could be found, and the average number of scholarships taken up has been about 60 per year. These scholarships are generous and have the added attraction that there is no "means test" applied to the candidate's parents. Why then are Britain's young men not attracted to mining? Perhaps the following considerations may explain why the shortage exists:

- (a) The fact that mining is essentially a dangerous and dirty job will doubtless influence many parents—especially those sufficiently affluent to provide their son with the means to fit himself for a more congenial profession.
- (b) The existence of those to whom nationalization spells ultimate frustration.
- (c) Insufficient co-operation between careers masters and the industry.
- (d) The inherent fear of a return to the conditions existing in the mines in the period between the wars.
- (e) The threat of competition from alternative sources of power, precipitating redundancy.
- (f) The relatively high academic standards of entry required by most universities coupled with the lack of facilities in many technical colleges to enable students to measure up to these standards. This is a very real problem to those already in the industry who for various reasons may have been obliged to curtail their ordinary education.

Although much is being done to stimulate the recruitment of potential mining engineers, a great deal remains to be done if the whole structure of the mining industry in the United Kingdom is not to be weakened because of insufficient struts.

The problem is not merely confined to attracting young men of calibre but also involves their retention. The N.C.B. have instituted a first rate training programme covering the first three years after graduation being a scheme of directed practical training devised in 1946 by the Institution of Mining Engineers.

It is on the completion of this directed practical training that the student is most vulnerable to misgivings and disillusionment. At that time he stands, reasonably well trained and full of enthusiasm but with no visible channel along which to direct his energy. Having done so much towards educating and training the student it is essential that the final gulf between the end of training and the taking up of statutory responsibility should be adequately bridged. Nothing is more calculated to dissuade a youth from taking up mining as a career than the sight of his more advanced student colleagues groping to find their niche.

B.O.M.A.'s Hopes for the Next Budget

The hope that the Chancellor of the Exchequer would recognize in the forthcoming Budget the damaging effect of the United Kingdom's Treasury appropriation of special overseas tax benefits and would take the necessary steps to put the matter right, both for the companies concerned and for their proprietors and shareholders, was expressed by Lieut. Col. J. Cross Brown, President of the British Overseas Mining Association, at the annual meeting held earlier this week.

A case in point to which he drew attention is the opening up of the Orange Free State goldfields where the heavy capital expenditure incurred is allowed by the South African Government as an offset against profits before any Union taxes are paid. But where British taxpayers are concerned the only effect of the concession is that it reduces the amount of Union tax available for double taxation relief. That is to say, the British tax is increased to the same extent as the Union tax was reduced. Nor is the frustration of being denied the benefits of such tax allowances merely an academic problem. It has the very practical consequence of placing British mining finance companies at a considerable disadvantage compared with their competitors abroad.

The Royal Commission dealt partially with this problem in their interim report in February, 1953, when they recommended as a matter of urgency that in assessing tax, arrangements should be made as soon as possible to grant credits equivalent in amount to the overseas tax certified as having been relieved by tax concessions granted by the overseas countries. This recommendation has not yet been put into effect. Yet even if this concession were operative it would not entirely meet the requirements of the British overseas mining industry because of the defect in the U.K. tax system of granting double taxation relief. Thus, in those cases where overseas countries collected part or all of their tax from the mining industry in the form of levies on production rather than on profits, such levies were not admitted for double taxation relief in the United Kingdom. The consequences of perpetuating such an arrangement are well illustrated in the case of one member of the Association who suffered total tax in the United Kingdom and the country of operation during its last two financial years amounting to 16s. 3d. and 17s. respectively per £ of net profit before taxation; while other members operating within the Commonwealth have been subjected to a much higher total rate of taxation than was borne by companies liable to United Kingdom taxation only.

As Col. Cross Brown pointed out in his speech, such a state of affairs is not likely to encourage further investment in ventures subject to such penal taxation and seems to be quite inconsistent with the high importance which the British Government attaches to Commonwealth development. In his own words "overseas mining is a speculative enterprise which cannot hope to secure the steady influx of capital needed to maintain and expand it unless the investor can reasonably hope for a higher net return from successful ventures than he can expect from a normal industrial concern working in this country. Apart from the risks inherent in all mining operations, in which each success has to pay for many failures, a mine working abroad gives further hostages to fortune by committing a great part of its assets irrevocably to the country of operation, where its position may at any time be prejudiced by changes in political conditions. Furthermore, unlike other extractive industries, such as rubber or tea planting, which can produce their crops from the same land year after year, the mining industry cannot replace the mineral extracted; each ton of ore taken from a mine is one ton nearer exhaustion of the deposit."

South Africa

(From Our Own Correspondent)

Johannesburg, December 2.

Over the past month there have been two interesting technical developments that have come to light. The more significant is, perhaps, the introduction of mechanical reef sorting at West Driefontein and Doornfontein, the two West Wits Line gold producers in the Gold Fields Group. This development is being watched with interest for the possibility of its being adopted in a similar or modified form on other properties.

The new technique is based on the friability of the carbon leader, which is to say that a large portion of the reef line breaks down into relatively small fragments and fines. The basis of the scheme is the passing of run-of-the-mine ore over a plus or minus 2 in. grizzly. The material passing through it, probably about one-third of the total tonnage, is mechanically sorted further and passed into the milling circuit at suitable points.

BENEFITS OF MECHANICAL SORTING

The coarser material then goes on to a sorting belt, the remainder of the reef is sorted out, and the balance—about one-third of the total tonnage—is passed on to a waste dump. At West Driefontein, waste-sorting has been practised for some time, so that the benefit to this mine will be less marked. Nevertheless, it is obvious that it will result in a reasonable improvement in the rate of ore recovered, and thus working costs per oz. of gold produced will decrease, although costs per ton milled will rise.

At Doornfontein, no sorting has been practised to date. Once the new scheme is in practice and sufficient tonnage can be drawn from the mine, the output of gold by the present reduction plant with its capacity of 50,000 tons a month will be equivalent to that which could be derived from over 70,000 tons a month without sorting. In other words, the introduction of this sorting technique will provide the equivalent of a third reduction unit.

Apart from the immediate applications, sorting can prove an important factor in new mines where close sorting of reef can be accomplished as the more efficient use of milling capacity means the conservation of capital funds in respect of reduction plants in the early life of a mine.

This question of reef sorting is most important in the case of properties exploiting the Vaal and Basal Reefs which are not as friable as the carbon leader. The actual gold bearing horizons are extremely narrow—often being 6 in. in width or less. At the same time, average stopping widths are of the order of 40 in. In consequence, there is a very large quantity of waste reaching the mill. Furthermore, the reef horizon is not easily identified as in the case of the reefs of the Central Rand where the pebble formation and very distinct parting make hand-sorting of waste a simple procedure which can be carried out by relatively unskilled labour.

The approach now being made to the problem is towards the use of some electronic device. Gold and uranium are intimately associated in the Vaal and Basal Reefs and rock displaying no radioactivity is barren. Some work has been done using a form of Geiger counter to activate mechanical hands or a similar device to separate payable material from waste.

Should this prove successful, the new mines will undoubtedly benefit considerably, with possibly a very high proportion of waste being eliminated before reaching the milling circuits. It has been suggested in one quarter that the position could be easily reached where a reduction plant

with a monthly capacity of 100,000 tons could produce at least as much gold as a 300,000 ton mine under present conditions.

CONCENTRATION BY FLOTATION

Another interesting development was contained in the joint announcement by Merriespruit G.M. and Virginia G.M. regarding uranium and pyrite recovery. Merriespruit is to pump slimes to Virginia. This is being done at other properties but the important aspect here is that the uranium and pyrite are to be concentrated by flotation before transferring the material to Virginia. There is no official information as to treatment costs per ton of residues, but it is not inconsiderable. Anything to reduce it, such as concentration, should, therefore, increase working profits. There is also the important feature of initial capital expenditure to be considered. Admittedly, this is provided in the form of loans and is not a drain on the company's resources, but at the same time, the capital expenditure has to be repayed over 10 years, plus interest, and it will be recalled that the amounts having to be deducted in most cases came as a shock to shareholders. As in the case of the reef sorting now being tried, the flotation process at Merriespruit will be watched carefully and probably applied at other properties.

The financial aspects of these developments, as indicated above, are most important, but they could also have quite important effects upon the labour problem as they would tend to increase output in terms of labour employed. The actual supply of African labour to the mining industry is running at a higher level than for some time past, but is still nowhere near total requirements. This is particularly true of the position on the older mines, especially on those where age and layout do not justify large scale mechanization.

IMPETUS TO MECHANIZATION

The European labour position cannot be regarded as satisfactory, particularly in respect of artisans and skilled workers in this category. Competition from secondary industry is still fierce, especially on the engineering side, where pay rates show no signs of coming down. The recruiting campaign for miners and artisans for the mines has not turned out to be very successful, as a great many of those who came out here—and particularly those from the Continent went into other occupations as soon as they could and quite a number of them did not fit in with their South African born colleagues.

Accordingly the impetus towards mechanization in every section of the mining industry is gaining strength under the influence of all these factors and it is likely to increase. One most interesting future development along this line will be when a move is made to open up the ultra-deep, rich, ground lying to the south of the West Wits lines when a completely new set of mining problems will have to be tackled.

NEW TAX ON TUNGSTEN ORES

Writing in our issue of December 10, 1954, our Portuguese correspondent pointed out that the export tax on tungsten ores in that country had been altered and that the present formula was:

$$T = (P \text{ less } 40)^2 = \text{tax per kilo concentrate.}$$

Where T=tax; P=price per kilo.

Our correspondent—as well as several of our readers—has since written pointing out that the formula as given last week is not correct, and should have read:

$$T = (P \text{ less } 40) = \text{tax per kilo of concentrate}$$

Developments in Titanium Metallurgy

By GRAHAM OLDHAM, B.Sc., F.R.I.C., D.I.C., M.Inst.F.

The marked progress that has taken place in titanium metallurgy during the last six years has placed the metal in a position perhaps equivalent to that reached by aluminium after twenty-five years of metallurgical development. Yet many technical problems remain to be solved in the fields of extraction, smelting and fabrication, while in addition improved facilities are needed for the exchange of information between metallurgists and the dissemination to the public of the resultant knowledge. The following article reviews some important aspects of titanium production and draws the conclusion that once the costs of production and smelting are drastically reduced and when suitable techniques for the working up of scrap are in operation, titanium will take its place alongside other basic metals such as copper and aluminium in the economic structure of the industrial nations.

Up to the present time, the Kroll process has been the most widely used method for the production of titanium. This process is inherently expensive, and it now seems certain that the newer methods being developed will soon render it obsolete. The difficulties which, up to now, have prevented more extensive use of the metal may be summarized as:

- (a) the overall expense of the process and final product as fabricated titanium in America may cost as much as \$25 a lb.,
- (b) the small batch production and difficulty in maintaining uniform quality, an important factor in a metal such as this where even a small degree of contamination with oxygen, nitrogen, carbon or hydrogen may cause a tremendous alteration in properties,
- (c) and the grave difficulties at present to be encountered in the reclamation of scrap material.

Apart from these disadvantages, it may be interesting to survey the problems associated with the machinability of titanium.

Early in the year, at a conference of the American Society of Tool Engineers, it was pointed out that because of the very sparing use of the metal, machining information was not readily available. Titanium is a poor conductor of heat and, in consequence, the heat produced from the machining process is localized at the point of cutting, with consequent damage to the tool.

At the recent symposium held in Cleveland by the National Aircraft Standards Committee, Dr. Lee Schapiro, Douglas Aircraft's chief metallurgist, expressed his lack of confidence in the market for light-weight titanium fasteners, an important potential use in the aircraft industry. The use of such fasteners would, he stated, cost about \$400 per lb. of weight saved and economically this would be prohibitive.

From the financial point of view the picture is somewhat confused. It would appear that, although the 1954 production of the metal will reach about 5,000 tons, a figure which is only about three per cent of the Pentagon's estimated demand for defence alone, the aircraft and other metal using industries have been unable to take up even this amount and the surplus titanium is therefore being purchased by the Federal Government for stockpiling.

NEW DEPOSITS

Although titanium is one of the commonest of the earth's metals, it is seldom found in concentrated deposits but is thinly distributed over wide areas, thus making the economic mining of the raw material very difficult. Up to the present virtually all the titanium production in the United States has been from ilmenite. Some rutile which is, of course, much richer in titanium, has been imported from Australia where it is recovered from titanium-bearing beach sands. Recently the Republic Steel Corporation acquired what promises to be the largest deposit of rutile in the Western Hemisphere. This deposit is in rugged country in the province of Oaxaca in Southern Mexico about 30

miles from Port Angelo on the Pacific coast. It is said to be readily mineable by underground methods and that transportation to the port presents no great difficulties.

The search for titanium minerals in Florida still continues. One of the oldest ilmenite workings, there, is that of the National Lead Company, half-way between Jacksonville and the Atlantic ocean. The Du Pont company has been working a deposit near Starke for the past year and is erecting a \$3,000,000 mining and processing plant at Lawtrey, a few miles north of the Starke operations. For some years now the Florida Ore Processing Company has been processing titanium bearing sands at Melbourne, half-way between Jacksonville and Miami, and the American Cyanamid Company is erecting a \$14,000,000 titanium dioxide plant at Savannah.

A large amount of survey work is now being undertaken by the Crane Company, which has an office at Panama City on the Gulf of Mexico. This company is sending its geologists along the west coast of Florida and is reported to have taken leases on several thousand acres situated midway between Pensacola and Panama City where a concentration of titanium on the beaches of Walton County has been attracting attention.

NEW METHODS OF PRODUCTION

It now seems certain that in a relatively short space of time, newer metallurgical techniques for the treatment of titanium will have supplanted the Kroll process. Earlier in the year Shawinigan Water and Power Company were stated to be producing high grade titanium metal electrolytically on a small scale, and the President of the company has stated that the process will ultimately result in a considerable reduction in price. Attention has naturally been focussed on electrolytic methods of production of some time and United International Research Inc. are reported to be operating a process similar to the Hall method of production of aluminium. Electrolysis is carried out at 700 deg. C. in an inert atmosphere but so far no complete details of the process have been given.

New reduction processes are now in operation in various parts of the world and, in general, involve sodium reduction of the tetrachloride. At a recent conference in Birmingham some details of the I.C.I. process were released. Although no prior information had been made available, it has been obvious for some time from a study of the patent literature that the sodium reduction method was receiving attention. A recent patent taken out by the company¹ covers a method for the reduction of titanium tetrachloride vapour in argon as a carrier gas. The reducing agent is metallic sodium dispersed in a fluidized bed of sodium chloride at a temperature of between 200 deg. and 800 deg. C. A somewhat similar British Patent² covers reduction of the tetrachloride with a mixture of sodium and potassium, the proportions being such that a low-melting mixture of the chlorides is produced. Another I.C.I. patent³ covers the use of liquid ammonia for the removal of sodium and sodium chloride from the titanium obtained by sodium reduction.

Until recently it had been believed that sodium reduction

on a large scale would be uncontrollable and that the metal produced would, in any case, not give good quality ingots. Research work in I.C.I. and other laboratories indicated that this was not necessarily true and in 1953 a semi-scale plant and then a larger pilot plant was erected, the latter commencing operations early this year. Even before the pilot plant came into operation work was commenced on a large scale plant which, it is expected, will come into production in the first half of 1955 and will have reached its full output by August. The output will be 1,500 tons per year and although the project is financed out of I.C.I.'s own resources, the United Kingdom government has agreed to purchase a proportion of the output over the next four years at prevailing prices.

The Titan Co. Inc. have patented a two stage process in which titanium tetrachloride is reduced by an alkali or alkaline earth metal.⁴ The first stage yields a lower chloride of titanium and sodium chloride and the lumps of mixed chlorides are, in the second stage, immersed in excess of the molten reducing agent to yield titanium metal. The Kennecott Copper Corporation have also patented a process⁵ in which the reducing agent is sodium amalgam.

The Electro-Metallurgical Company, a division of Union Carbide and Carbon Corporation, are to build a \$31,500,000 plant at Ashtabula, Ohio, which will give an output of 7,500 tons a year. Pilot and prototype plant is already in operation and employs the sodium reduction method. The General Services Administration is to purchase the metal which remains unsold over an initial five year period.

LATER PROCESSING TECHNIQUES

The Mallory-Sharon Corporation of America has recently announced that it is producing titanium ingots by a double melting process operated by remote control. The high temperatures involved in the melting of titanium require unusual care and the new furnaces have been constructed to withstand higher pressures than normal.

A new arc melting vacuum furnace, capable of pouring a 50 lb. charge of titanium has been added to the equipment of the National Research Corporation of America. It is designed for use with the N.R.C. titanium shape casting process and is to be used for the further development of titanium melting and casting techniques. This process gives sound titanium or titanium alloy castings with a good finish and the corporation is licensing it on a non-exclusive basis.

Many firms have experienced machining difficulties of various kinds, but it should not be thought that no attempts have been made to deal with this problem. The Curtiss-Wright Corporation of America have, at the request of the United States Air Force, investigated the production machining of new titanium alloys. The results of these investigations have been published in the form of a booklet entitled "Increased Production and Reduced Costs Through a Better Understanding of the Machine Process and the Control of Materials, Tools and Machines."

In the United Kingdom research and development work has been carried out by I.C.I.'s Metals Division on processes for melting and fabricating titanium and its alloys. A major plant for melting and preliminary fabrication will be completed early next year when supplies of rod, sheet, strip, tube and wire will be available on a large scale for the aircraft and other industries.

As a result of laboratory tests, Dr. Paul Schwarzkopf, an authority on powder metallurgy, has predicted that the powder metallurgical process will be used for the production of structural titanium. He has further suggested that the use of such techniques will result in the cost being reduced to one-fifth of its present level.

Titanium has aroused great interest due to its extra-

ordinary physical properties. The metal has a very high strength/weight ratio and therefore has a special application in supersonic aircraft where it is used for airframe construction. Its corrosion and heat resistance render it specially suitable for use in jet aircraft.

The fatigue properties of commercial titanium are quite good, the endurance limit being about 50 per cent of the ultimate tensile strength. There are two allotropic modifications of titanium and three main types of alloy are therefore possible, those with an α or hexagonal structure, those with a β or body-centred cubic structure and finally, those with $\alpha + \beta$ structures. The α structures have high strength whilst the β structures may be easily fabricated and the $\alpha + \beta$ structures possess, in part at least, both of these desirable properties. Typical α alloys are the binary systems with tin and aluminium and commercial examples of β alloys contain seven per cent and eight per cent manganese.

Already the Camcar Screw and Manufacturing Corporation of America are providing standard and special titanium fasteners in production quantities using titanium alloy RC130B. This alloy contains 92 per cent titanium, four per cent aluminium and four per cent manganese, has a high tensile strength, and can withstand temperatures up to 800 deg. F. It weighs approximately 44 per cent less than alloy steels of equivalent strength and is very corrosion resistant, withstanding 250 hours of salt spray without being affected.

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1. Aust. Pat. Appl. 18,828/53
2. B.P. 697,530
3. B.P. 697,917
4. B.P. 694,921
5. Canad. Pat. 489,436—8.

BOMA on Graduate Recruitment

Speaking in London last Monday at the annual general meeting of the British Overseas Mining Association, the president, Lt. Col. J. Cross Brown, made it clear that his association still had the problem of stimulating graduate recruitment very much in mind. We quote his observation on this matter:

"A study by a joint committee of the Association and the Institution of Mining and Metallurgy concerning the supply of trained technologists for the overseas mining industry led to the conclusion that the current intake into the universities and mining schools of young men offering themselves for training for technical posts in the industry, especially as mining engineers, is inadequate to meet the estimated needs of the industry five years and more ahead.

"The plans recently announced by the Government for a wide expansion of facilities for technological education are most welcome but it is interesting in this connection to recall H. A. L. Fisher's definition of mining in his *History of Europe* as 'the prolific parent of science and technology.' An adequate supply of minerals and metals must be made available to serve the increasing needs of industry and it is, therefore, important to a far wider range of interests than those of the mining industry alone, that future supplies of competent staff for the overseas mines shall be assured.

"The immediate problem of the overseas mining industry, however, is to ensure that sufficient new entrants come forward to make full use of the training facilities at present available. In view of the heavy demands for technological staff from other industries, it is clear that the approach to this problem must be on imaginative lines if it is to meet with any success. This matter is being carefully studied and appropriate action will be taken by the Association as soon as they have decided what methods of approach are likely to be most effective."

Airborne Exploration for Uranium

Airborne radiation surveying has proved a rapid, cheap and effective method of uranium prospecting, and the technique employed is relatively simple when applied as a supporting function of a general prospecting programme. The following article is the condensation of a paper under the same title which was presented at the 1954 Mining Show, American Mining Congress, by R. S. Foote, chief of the geophysical exploration branch in the Division of Raw Materials, United States Atomic Energy Commission. After describing the technicalities of aerial prospecting, the author describes the operational methods used and concludes with brief remarks on the standard equipment employed.

Uranium ore on the ground can be located from the air by detecting the radiation that is always given off by natural uranium ore. This is generally true, although certain qualifications are in order. First, airborne surveying can result in the detection and location of outcropping uranium ore only if the outcrop is large enough or high enough in grade. Second, the actual size and grade that can be detected depends upon the altitude of the survey, the speed at which the aircraft flies, and the type of instrumentation utilized. At 100 ft. or less, by use of the correct technique, a survey should be able to detect an outcrop several hundred square feet in area of an average grade of 0.1 per cent, U_3O_8 . Generally speaking, a smaller area can be detected if the grade is higher. At between 200 and 500 ft. a survey should detect all outcrops with an area larger than 1,000 sq. ft. and a grade of approximately 0.2 or 0.3 per cent U_3O_8 , although these are only general estimates.

APPLICATION TO EXPLORATION

Certain other factors must be considered in the evaluation of the technique. Production of radiation is not unique to uranium ore, as there is radiation present at any location on the earth and what is sought is an increase in rate of radiation and not merely the detection of radiation. The indication of natural radiation by an instrument—the background reading—and all indications of additional radiation or anomalies are measured in terms of increase over the background reading.

In addition, there must be enough uranium ore outcropping at the surface to supply enough radiation for a readable increase. With the aircraft flying at some particular altitude there may be small amounts of uranium mineralization outcropping below that cannot be detected. For all practical purposes the ore must be exposed because a foot or so of barren overburden will render undetectable the gamma radiation from the ore beneath it.

The grade of outcropping ore cannot be determined by an airborne survey, although the general extent of a deposit can be determined in special cases where something is known of the geological control and it is possible to fly close enough to the outcrop (20-50 ft.). At altitudes above 500 ft., many small areas of mineralization will not be detected even with the best instruments. Outcrops that are detected at or above 500 ft. will be difficult to locate on the ground and difficult to partially evaluate by an observer from the air.

To be effective, an airborne survey must be planned on the basis of geologic guidance. The probability of success is greatly increased by flying, not merely geographical areas, but areas selected on geologic favourability. Some examples of effective application would be the surveying of areas that might be extensions of already existing deposits, extensions of structures known to be favourable, or extensions of sedimentary horizons known to be favourable. On the Colorado Plateau the nature of terrain and outcrops makes it a very favourable area for the application of low level airborne surveying.

To gain full advantage of the airborne surveying techniques, regardless of the altitude at which the operation is

carried on, an experienced geologist should observe from the aircraft. He should be familiar with the geology in the area under consideration and the expected flight path is planned and drawn by the geologist on the aerial photographs before the operation is begun, and indications of radioactivity above background must be adequately tied in with a ground location. In low level work the point on the ground is visually located by the geologist-observer and the location is plotted on aerial photographs or on photo index sheets. This positioning technique is not as effective when surveys are made at higher altitudes of from 200-500 ft., or while flying areas regard to particular geologic factors. In these instances, it is feasible to fly pre-designed flight paths on an aerial photo index sheet or mosaic while taking small aerial photographs in strips along the flight path. After the small photographs have been developed and the pictures matched to the same location on the master air photographs, a good flight path location is obtained.

Two general flying techniques are used. Rim or outcrop flying follows local geologic features, and the aircraft is flown 50 to 100 ft. from the outcrop whether it is on the face of a cliff or on a horizontal surface. The grid flying technique is used while surveying large areas, or areas which have been selected on a basis of general geologic favourability without respect to certain formations or structures. The spacing of the grid lines and the altitude of flight must be determined considering the specific problem at hand and usually is decided by the planning geologist. The amount of coverage or the area that will be scanned on the ground from a certain altitude can be estimated by assuming that a width of a path covered on the ground will be twice the altitude at which the aircraft is flown, thus flying at 100 ft., a path on the ground approximately 200 ft. wide would be within the range of detectability. There is no relationship between the size of the anomaly as indicated in the air and the amount of uranium that is present on the ground.

OPERATIONAL EQUIPMENT

The type of aircraft used depends in part on the type of flying planned. For most low level work, small single engine aircraft with manoeuvrability at low air speeds and with a high rate of climb must be used. Flexibility of operation is important if it is intended to use the aircraft as a general tool in support of exploration. In this event, the aircraft should have adequate service ceiling—around 20,000 ft. and should have a speed range of around 50-120 m.p.h. air speed. Helicopters have been used and are desirable for very special situations where fixed wing aircraft are not suitable. In general, however, the lack of flexibility at reasonable cost restricts the use of helicopters.

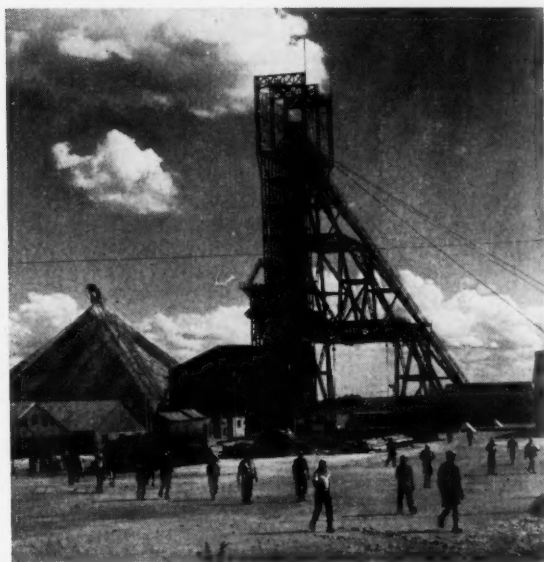
The gamma detection instrument should be a scintillation type with a plastic or sodium iodide crystal. The crystal volume should be as large as possible up to 30 or so cu. in. and the crystal size required depends upon the altitude and speed of aircraft operation. The operational cost of an airborne survey including one aircraft, one geologist observer, a pilot, and all operating and maintenance costs, should run between \$1.50 to \$3 per surveyed mile.

S.A. MINING TRENDS—IV

Current Mining Practice at West Rand Cons.

West Rand Consolidated commenced gold production in 1908, five years after its incorporation in South Africa, and in September, 1952, became the first South African mine to produce uranium. The company is in the General Mining Group and currently depends almost entirely on its uranium profits. In the following article, which has been specially contributed to *The Mining Journal* by a South African correspondent, an interesting description is given of the company's current development operations and mining practices together with a brief exposition of its reduction and uranium plants.

Considerations that had to be taken into account in developing and mining the Bird Reefs at West Rand Consolidated were the narrow widths of the conglomerate bands, the relative high incidence of faulting, the steep reef dip, and the costs of extraction which are by no means negligible. It was, therefore, necessary to stope to as narrow a width as possible while providing an adequate and practicable depth of face thereby excluding as much waste rock as possible from the flow to the treatment plants. Indeed, these were the factors which mothered the evolution of stoping methods that made possible mining at a face with of only 30 in.



The Deep Shaft headgear

Development operations at the raise are undertaken by means of reef drives spaced at vertical intervals of 150 ft. from which raises are cut at strike intervals of about 800 ft. Each raise constitutes the initial scraping gully for the stope. The face, 30 in. wide, is advanced 22 ft. and in the course of this advance, the ore, not thrown back into the raise by the blast, is hand-lashed back and then scraped down to 1-ton side-tipping cars. After the stope face has been carried 22 ft., another shallower gully is cut on dip in the footwall rock. The broken waste which is packed as a wall behind the gully, contributes supplementary support to that given by the conventional mat packs, and assists in directing the ventilation flow up the stope face being worked. The rotation stoping, gully-cutting and gully-wall packing is repeated as operations proceed.

The depth of the gully obviously facilitates the mechanical scraping of the broken ore down to the cars and easier personnel movement. It is found that with the stope face 10 to 15 ft. ahead of the gully much of the broken ore is thrown back by the blast into the gully. Beyond that range of distance most of the broken ore re-



Close up of West Reduction plant

mains scattered on the stope floor. In both cases this ore is hand-lashed back into the gully. The remaining fines are hydraulically swept back into the gully. Obviously a smooth floor is necessary to avoid loss of high-value fines. Jackhammers entirely man-handled give this condition. It has been found that stope air-legs are prone to result in an uneven floor, especially where the dip is steep. The loaded cars are trammed and tipped over passes or boxes discharging down into haulage drives connected with the shaft-pass-system, or on the appropriate levels are trammed directly to the shaft pass-system.

GOLD-URANIUM PLANTS

A new development is the substitution of cyclone classifiers for the bowl classifiers in the final classification circuit of the mill. The overflow from these classifiers is cyanided in the usual manner, and the filtered slime residues constitute the feed to the uranium extraction plant. Extensions to the gold-uranium reduction plant, the uranium plant and the fluo-solid sulphuric acid plant are nearing completion and should be commissioned by the year-end. Then as now, every effort will be made to maintain uranium oxide output at maximum rates, even at the expense of output from the plants producing gold only. The extended plants are expected to enable the company to reach the output rate undertaken.



Filtering the final product in the uranium plant

Large Crusher for U.K. Quarrying Industry

During recent years shortage of manpower and increased demand for crushed stone have together promoted the mechanization of many quarries in the United Kingdom. This mechanization has in turn brought about a need for large primary crushers, of which many of the units manufactured by Hadfields Ltd. are in service at limestone quarries. The following article describes the largest jaw crusher built by the company for incorporation in the preparation plant constructed by Ernest Newell and Company Ltd. for the Wirksworth limestone quarry of Stewarts and Lloyds Ltd.

The new giant jaw crusher manufactured by Hadfields Ltd. for operation at the limestone quarry of Stewarts and Lloyds Ltd. at Wirksworth, Derbyshire, has a feed opening of 72 in. by 48 in. and by United States standards cannot be regarded as a big machine. Yet it is a large unit according to the standards prevailing in the United Kingdom, and some of the larger components were only just accommodated in the manufacturers' pattern, foundry and machine shops.

Steel castings, of course, are the principal materials used in the construction of the crusher, but use is also made of cast iron and of Hadfields Era manganese steel, the latter being employed for the construction of parts subject to abrasive action in the crushing cavity. An indication of the departure from normal dimensions which has been promoted by the construction of this new crusher is given by the realization that Hadfields Ltd. have hitherto manufactured many large primary crushers in sizes ranging from 48 in. by 36 in. to 60 in. by 48 in. as an answer to the increasing mechanization and the shortage of manpower existing in the quarrying industry.

The frame of the new crusher consists of four toughened steel castings with the heavily-ribbed side-plates being bolted to deep box-section end pieces. The joints are accurately machined, while substantial vertical tongues on the end pieces mate with grooves in the side-plates to eliminate shear stress on the tie-bolts. The planing and boring of housings for the swingstock shaft and the eccentric-shaft bearings were carried out in keeping with the normal practice, the pair of side-plates being bolted together, and specially-prepared distance pieces being used to ensure accurate lineability in the completely assembled frame. The boring of the housing for the swingstock shaft was made with the bearing caps in position. An interesting feature common to all the Hadfield Blake-type crushers is that the method of anchoring the swingstock shaft ensures that the shaft becomes a rigid distance-piece between the side-frames at their highest point, and thus contributes enormously to the stiffness of the already substantial structure.

CLOSE MACHINING OF COMPONENTS

The front end of the frame which carries the fixed jaw-plates is machined on its inner vertical face. This method provides the ground backs of the jaw-plates with a good surface to bed upon and makes this surface truly parallel with the shafts. The rear end frame which must present a good bedding face for the adjusting wedge, and must lie parallel to the shafts, is machined in the same way. A deep box section characterizes the swingstock, again a toughened

steel casting, carefully line-bored and fitted with gun-metal bushes to swing freely on its shaft. As with the frame, it is machined to provide a good bed for the ground-back renewable jaw faces, which are secured to it by wedge-blocks and blocks. The lower rear end of the swingstock is machined out where the toggle bearings fit and the toggle bearings, made of a hard-wearing chrome steel, are held in place by set-screwed wedge-blocks, making renewal of those bearings a simple and housing and securing the toggle bearings applies also to the pitman and toggle-block, both toughened steel castings.

As is usual with large jaw crushers the pitman comprises two parts, the cap and the body, with the registering joints fully machined. With the two parts bolted together the "eye" of the pitman is bored out to receive renewable half bearings, which consists of machined cast iron casings lined with white metal. A tin-base metal of high grade is employed for the top half and a lead-base metal for the bottom half. The latter does not carry load but functions as a closer against entry of dust. The pitman cap has a water-box cast integral with it, a cast iron cover with gasket is fitted and

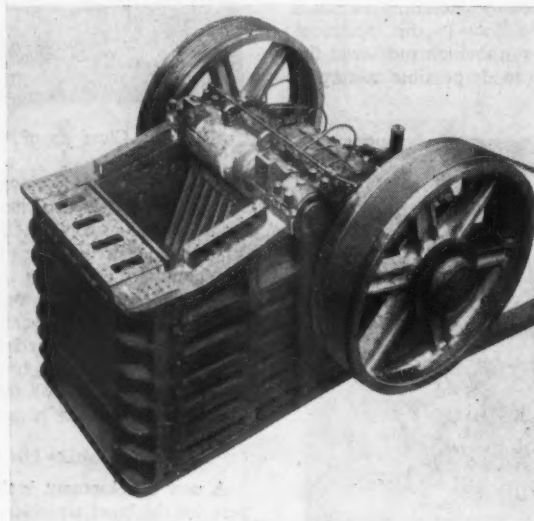
is provided with screw-threaded inlet and outlet holes for coupling.

COOLING AND LUBRICATION

Provision for circulation of cooling water is also made in the main (frame) bearings but in this instance the cast iron castings have water-chambers cored in. White metal linings complete the bearings, high quality tin-base metal again being used, with lead-base metal as a lining for the non-load-carrying bearing caps. The shafts are machined from forgings of 40 ton carbon steel.

The diameter of these wheels is calculated to give the most efficient speed of driving belt. The wheels are iron castings of the six-arm type, with solid rims and three splits in the hubs, the splits being fitted with filler-plates and the machined hubs having forged steel hoops shrunk onto them at each side. To counteract the effect of the gyration of the heavy mass of the pitman, the eccentric portion of the main shaft and the toggle-plates, balance weights are cast integral with the rims of the flywheel-pulleys, and a high standard of smoothness in running is achieved.

Lubrication of the bearings is carried out by two separate motorized mechanical lubricators, one of which supplies grease to points near the outer edges of all bearings and the other which delivers oil to the more central points. In the event of either of the mechanical lubricators failing in service, no bearing will be left entirely without lubricant.

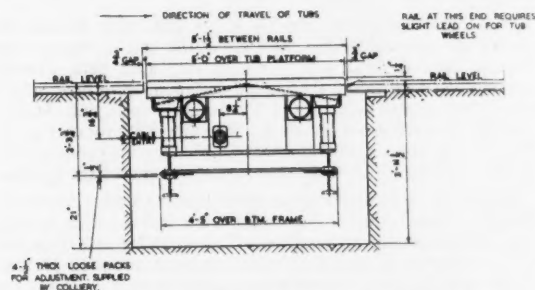


The new jaw crusher

MACHINERY AND EQUIPMENT

Vibrating Platform for Tub Loading

Due to the settlement of a load in transit after leaving the loading point of a mine or quarry, it is not unusual for cars to reach the tipping point with the load several inches below the lip of the car. Considerable advantage can therefore be gained, particularly in increasing hauling capacity, if all voids in the load can be eliminated to ensure that the loads reach the discharge point without further compacting. One method of achieving this is to employ vibrators at the loading point,



Section of the platform vibrator

which cause settlement of spoil as it is loaded, and one such device is manufactured by the Butterley Company Ltd.

The Butterley platform vibrator consists of a steel platform fitted with rails and located beneath the loading point in such a position that each tub rests on it during filling. The platform is set on helical springs at each corner, these components, together with the 5 h.p. motor, being carried on a girder framework. The motor, which is totally enclosed, continuously rated, and flame proof, rotates an eccentrically mounted weight through a chain and sprocket drive. The resulting out-of-balance forces create a high frequency oscillation which is transmitted through the platform to the tub being filled, causing the coal to settle down in the voids.

The mechanism of the moving platform is totally enclosed to give protection against dust and moisture and is provided with external, grouped lubrication points for ease of maintenance.

The supporting frame is usually built into the floor of the roadway and an inspection and spillage pit is provided as required to suit site conditions. An inverted V-plate is welded to the platform between the rails to deflect any spillage into the pit and thereby minimize impedance to moving tubs. The platform is not attached to the supporting frame but merely rests on the springs at the corners, and lifting holes are provided to enable it to be raised to give full access to the motor and all working parts.

The vibrator is provided with a double row of self-aligning, long-life ball bearings, carried in heavy housings designed for vibrator duty. The makers claim that it has been specially designed to meet the arduous conditions of pit service with the minimum of maintenance. Various sizes of vibrator are available to suit small tubs and mine cars up to 5 tons capacity, built to any rail gauge. The vibrators range from 5 ft. to 15 ft. in length, and in tests carried out under working conditions have shown an average of 483 tubs saved per week.

Trunk Conveyor Installation

A film entitled *Trunk Conveyor*, dealing with the planning and installation of a trunk conveyor in Woolley and Park Mill Collieries, No. 6 Area, N.C.B., has recently been completed by Richard Sutcliffe Limited. The film is available on 35 mm. and 16 mm. sizes and runs for approximately 30 minutes. The film emphasizes the care necessary at all stages of installation to ensure efficient and long service and several interesting points are made. These are that it is advisable for management to obtain the advice of the equipment manufacturers to ensure

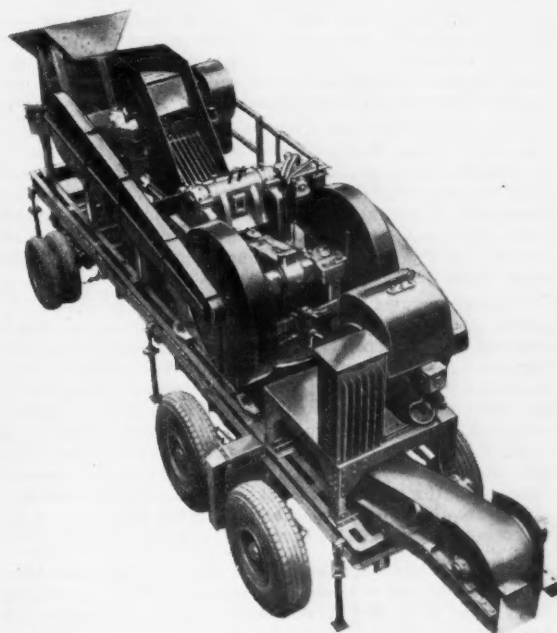
that the most suitable type of equipment is used and that all sections of the colliery staff who will be affected by the installation should be consulted. Planning, storage and final installation deserve marked attention and proper inspection and maintenance is desirable. Indeed, at installation the manufacturer's service engineers should be in attendance and the maintenance schedule they suggest should be followed to ensure efficient operation.

A second film of slightly less interest to those connected with the mining industry was produced by the company some time ago. Entitled *Three Installations* and available in 35 m.m. and 16 m.m. sizes, this film deals with a scheme for handling iron ore, coke and limestone for Normanby Ironworkers, a method of handling bagged cement to road or rail transportation, and a system of conveyers for excavating a dock for Manchester Ship Canal Co.

The Reduction of Basic Slag

The Baxter Knapmobile, manufactured by W. H. Baxter Ltd., was originally designed and manufactured to the order of the National Coal Board for the reduction of basic slag for pneumatic stowing experiments. The unit is 32 ft. 6 in. long, 8 ft. wide, 13 ft. high, and weighs 23 tons.

In the operational procedure, a plate apron feeder of the steel tray type carries run of mine or quarried material to a Baxter 24 in. by 15 in. knapping motion stonebreaker over a fixed bar grizzly which removes much of the fines from the feed to the stonebreaker. An 18 in. troughed belt conveyor carries the fragmented material to the plant secondary section.



The Baxter Knapmobile

This equipment is transported on a strong steel chassis with twin wheels at the front and single tandem wheels at the rear. Vacuum air cylinder brakes are fitted to the rear wheels and hand operated parking brakes are also included. A 45 h.p. electric motor will drive the complete plant and, should diesel power be required, a Lister vertical FR 6 engine with hand operated clutch is fitted. The stonebreaker will reduce 16-23 tons per hour of 12 in. material to 2½ in., and the plant has a capacity of 40-45 tons per hour, 50 per cent through the stonebreaker.

METALS, MINERALS AND ALLOYS

COPPER.—Copper has continued in keen request in the United States and some custom firms have reported that buyers have asked for more metal in January than they had bought for December delivery. It had always been assumed that some part of recent copper buying was for the re-stocking of inventories for taxation accounting purposes and that this element in demand would evaporate at the end of the year. It is impossible to assess how much copper has been tucked away, but estimates of the duration of the present tight supply are weekly pushed back and consumers are not now expected to be comfortably placed until the latter half of the first quarter of 1955. A fairly general conviction that the American economy is once more on an upswing contributes strongly to this feeling. This prompts the question whether any other producers will follow the example of Kennecott's Utah Mine and go on a seven-day week. Meanwhile the producer's price remains at 30 c. although small parcels are said to be passing from dealers to hard pressed consumers at a 3 or 4 c. premium.

There is no firm news of discussion on the offer made by African producers to sell copper in the United Kingdom on long contracts at stable prices. It is idle to speculate on a scheme of which the details are not known, but it is rumoured that only two producers were concerned in the talks at the outset, and it is worth pointing out that no conceivable scheme for such long term sales would have much chance of success unless the producers were fairly unanimously agreed in support of it. American trade circles continued to be impressed by the idea of the scheme and have emphasized the span of prices—which has been nearly £100 since dealing began on the London metal exchange. However, it is worth pointing out that from mid-February to mid-September the United Kingdom price stayed pretty nearly within £5 either side of £240, and that the really violent movements have been confined to trading on the very first day and in the last quarter. Meanwhile, another report has it that a number of Canadian copper producers have offered to sell copper in London at a price well below either the current spot or 3-month prices and equivalent to 31.25 c. New York.

It is reported from the Copperbelt that branch meetings of the African Mine Workers Union have been told that a strike in support of their wage claim has been fixed for early January. This has been officially denied by the president of the union. Outwardly, at any rate, the union's policy is to defer a decision on a strike until the Chamber of Mines has considered its request for the discussion of issues other than the straight wage claim.

It is also reported that Mr. Dendy Young has been asked by certain sections of the European Mineworkers Union to address meetings in the Copperbelt. Mr. Dendy Young has consistently supported the Europeans' objection to the Forster report. This is a regrettable move for it will tend to confuse opinion as to the motives inspiring the unions' objection to the Forster proposals. Mr. Dendy Young's Confederate Party, of which he is the sole representative in the Federal Parliament, has been associated with the ideas of separate electoral rolls and separate development for whites and blacks. The reported invitation is not apparently an official one, but that it has been made at all will occasion regret and, to some at least, alarm.

LEAD.—Demand for lead in the United States has been at least steady and at times quite good with the price holding at 15 c. per lb. in New York. General Services Administration has asked for offers of metal for delivery by February 15 to the stockpile, although it delayed making the request till December 10.

Following the recent demand of the National Lead and Zinc Committee for higher duties on imported metal, the annual convention of the North-West Mining Association has asked for both higher duties and import quotas; the higher import duties would be lifted at "proper price levels."

American mine production of recoverable lead amounted to 263,400 tons in the first 10 months of the year. Calculated on the monthly average this gives an estimated output of 315,000 tons for 1954, this is not only below the 384,098 of 1953 and 337,204 of 1952, it is below every year since the depression year

of 1934. Mine output did, however, show a slight increase on the month from 24,994 tons in September to 25,503 in October. Unfortunately there was also a slight increase in refined lead stocks in the hands of smelters and refiners from 79,190 on October 1 to 80,650 on November 1.

TIN.—Tin has remained the steady but quiet market in the United States that it has been for weeks past. The revival of sterling has tended to lessen the profitability of shunting transactions but though this helps the market it does not effect the industry's main concern, the tendency to develop a depressive surplus.

It is encouraging for the I.T.A. to note that Britain has ratified the agreement on behalf of herself and of Malaya and Nigeria, even if these were some of the safest bets. Canada, Australia, Denmark and the United Kingdom have now ratified giving 208 of the necessary 333 consumer votes and Malaya and Nigeria have given 418 of the necessary 900 producer votes. This will be some encouragement to the interim committee of the Tin Council which is due to meet at the end of the month.

Meanwhile, an announcement from Kuala Lumpur states that Malaya's contribution to the buffer stock will be made in cash only and is expected to be about \$(Straits) 50,250,000. This sum will be gathered by compulsory deduction of about 10 per cent of the value of all tin concentrates delivered by mines until the total sum is collected. New mines starting after November 17, 1954 (the date on which the rules to implement the agreement was published) will be given assessments of one picul for every horse power of machinery installed, if the I.T.A. comes into effect. There will be no limit to the number of such new mines which will receive these assessments until they and all the old mines receive new allocations 30 months after the agreement has been in force.

This announcement throws some light on the interpretation of the rule of the I.T.A. concerning producers' obligation to furnish supplies to the buffer stock. According to the rules not more than 75 per cent of a producer's contribution may be in metal, but there is no rule to say that any of it *must* be in metal and the decision to provide cash or metal clearly depends on the cash-metal equivalent. That Malaya is to supply cash suggests that the cash metal equivalent will be somewhere at the lower end of the price range and at least below the expected ruling price when the agreement takes effect. It is reasonable to expect that with the buffer stock manager entering the market with cash but no metal the price might be inclined to strengthen.

ZINC.—Zinc has enjoyed a fairly good demand in America throughout the week particularly from die casters and galvanizers. The price has held at 11.50 c. per lb. East St. Louis. December tenders have been requested by General Services Administration although producers were pained that the request was uncommonly delayed.

The American Iron and Steel Institute's figures for deliveries of galvanized sheets during October was 209,498 tons, the seventh month in succession that deliveries have exceeded 200,000. Thus in spite of the fact that the January deliveries were only 169,086 tons and well below those in any month of 1953, deliveries for the whole of 1954 are expected to exceed handsomely those of 1953. These figures reflect the boom in construction.

Other zinc statistics are also fairly encouraging. Smelter stocks declined again for the sixth successive month from 152,137 tons at the beginning of November to 134,685 at the end. It is more than a year since they have been as low. Deliveries to domestic consumers rose to 79,583 tons in November, the highest for two years; and taking into account deliveries for export and the stockpile the total at 97,598 tons was the best for any month for the last seven years. On the other hand there was a considerable increase in smelter productions from 67,407 to 80,119 tons which reflected the re-opening of Anaconda's Montana concentrator.

Mine production for the first ten months reached 387,000 tons which would give an annual rate of 465,000 tons—the

lowest since 1934.

ALUMINIUM.—According to reports from Bonn, the West German Government is planning to raise its import quota of duty free aluminium by 3,500 tons to 9,500 tons a year to keep pace with the increased domestic demand. The likelihood of the proposal being approved by the Government is, however, contingent upon exports of alumina being raised some four-and-a-half times above the present figure.

Yet another potential source of aluminium consumption is seen in the production of an oil derrick, made entirely of aluminium, by Reynolds Metals in co-operation with a Tulsa, Oklahoma, manufacturer. The derrick is in operation at an Oklahoma oil field and effects a saving in weight of approximately 40 per cent.

Iron and Steel

British steel is ending the year on the crest of a wave of prosperity, which is now spreading to Europe and America. U.S. steel production is still well below capacity levels but it is rising rapidly, and German producers have attained the highest output since the end of the war. Moreover, the rise of one per cent in British steel prices, has been eclipsed by much steeper advances now quoted by European producers whose order books have filled up so rapidly of late that they too are now indicating delivery dates several months ahead. It is reported that some German makers have withdrawn from the export market; altogether others are indicating delivery dates five or six months ahead and are quoting much above the levels fixed by the European Coal and Steel Community.

The rise in British scrap prices ranging from 2s. 6d. to 30s. per ton has narrowed the margin between the prices of scrap and pig iron as competitive materials for steel making, but the pressure for deliveries of both is unabated. With ingot production now running at the rate of 19,500,000 tons per annum, consumption of raw materials has risen to enormous dimensions and heavier imports will be necessary until more blast furnaces can be brought into production.

The Christmas holidays will interrupt steel makers' outputs but only to a small extent. A large proportion of the plants will be working as usual but at best there will be a considerable volume of uncompleted orders at the end of the year, and these will command first attention in the new year, before new commitments are entertained. It has become virtually impossible to place prompt orders for most classes of finished steel products with the makers, but the build up of stocks during the summer months has enabled suppliers to fill many gaps. In the last two months about 150,000 tons of steel have been withdrawn from the stockpiles, but at the end of October there were still 973,000 tons in stock and this material should help to meet emergency calls until more new plant is available.

The London Metal Market

(From Our Metal Exchange Correspondent)

There has not been much movement in tin prices and the market has been rather quiet. It seems that operations in cheap transferable sterling are still having their effect and tending to hold prices down. Great Britain has now ratified the International Tin Agreement on her own behalf and that of Malaya and Nigeria. It is announced that the Malayan contribution to the Buffer Stock will be in cash by the deduction of about 10 per cent of the value of all concentrates delivered to the smelters until a total sum said to be \$50,250,000 has been collected. On Thursday morning the Eastern price was equivalent to £720½ per ton c.i.f. Europe.

Copper has been a very firm market, especially for the near position, but the immediate tightness seems to be easing and the backwardation has narrowed somewhat. Consumption continues at a high rate but there seems to be some slackening off in purchases for forward delivery. This may have been brought about by the talks of price stabilization mentioned last week. In the U.S.A. a tight spot position still exists, but the principal producers are maintaining their price at 30 c. per lb. and allocating supplies.

Lead has been an easier market as sales of metal for early

arrival have had a slightly depressing effect resulting in a contraction in the backwardation, and in fact the establishment of a contango between first-half-December and the second-half of this month. Consumers seem busy, but there may be some slackening down in demand over the Christmas holidays. Buying in America is reported to be fair, and the U.S. Government has called for offers of home-produced metal for the usual monthly stockpile buying.

There has been a better tone in the London zinc market, and a small backwardation has appeared. The rate of consumption both here and on the Continent continues good. Stocks of slab zinc in America for November show a substantial drop, and this no doubt has helped sentiment although there is no shortage of metal. The U.S. Government has called for the usual monthly offers for the stockpile.

Closing prices and turnovers are given in the following table:—

	December 9		December 16	
	Buyers	Sellers	Buyers	Sellers
Tin				
Cash	£718	£718½	£711½	£712
Three months	£716	£717	£711½	£712
Settlement		£718½		£712
Week's turnover		850 tons		425 tons
Lead				
Current month	£104½	£104½	£103½	£103½
Three months	£103½	£103½	£102½	£103
Week's turnover		2,725 tons		1,950 tons
Zinc				
Current month	£81½	£82	£82½	£83
Three months	£81½	£81½	£82	£82½
Week's turnover		3,150 tons		2,575 tons
Copper				
Cash	£285	£286	£279½	£279½
Three months	£268½	£269	£266	£266½
Settlement		£286		£279½
Week's turnover		5,550 tons		3,850 tons

OTHER LONDON PRICES — DECEMBER 16

ANTIMONY

English (99%) delivered,		
10 cwt. and over	£210	per ton
Crude (70%)	£200	per ton
Ore (60% basis)	22s./24s. nom.	per unit. c.i.f.

NICKEL

99.5% (home trade)	£519	per ton
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OTHER METALS

Aluminium, 99.5%, £156 per ton	Osmium, £46 oz. nom.
Bismuth	Palladium, £6 15s. oz.
(min. 2 cwt. lots) 16s. lb.	Platinum, £30/£31
Cadmium (Empire), nominal	Rhodium, £43 10s. oz.
Chromium, 6s. 5d./7s. lb.	Ruthenium, £22 oz.
Cobalt, 21s. lb.	Quicksilver, £110
Gold, 251s. 5½d. f.o.z.	ex-warehouse
Iridium, £39 oz. nom.	Selenium, 35s. 9d. nom.
Magnesium, 2s. 4d. lb.	per lb.
Manganese Metal (96%-98%)	Silver 74½d. f.o.z. spot and
£225/£262	74d. f.d.
Osmiridium, £40 oz. nom.	Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth	40% 6s. 3d. lb. c.i.f.
	30% 5s. 0d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (semi-friable) 48%	£12 8s. 0d. per ton c.i.f.
" Refractory 45%	£12 14s. 0d. per ton c.i.f.
" Smalls 44%	£8 5s. 6d. per ton c.i.f.
Magnesite, ground calcined	£26-£27 d/d
Magnesite, Raw	£10 - £11 d/d
Molybdenite (85% basis)	102s. 4d. - 103s. per unit c.i.f.
Wolfram and Scheelite (65%)	194s. 0d./197s. 0d. - U.K.*
	Gov't Stock d/d 196s. 0d. plus charges
Tungsten Metal Powder	17s. 0d. nom. per lb. (home)
(98% Min. W.)	
Ferro-tungsten	14s. 0d. nom. per lb. (home)
Carbide, 4-cwt. lots	£37 6s. 3½d. d/d per ton
Ferro-manganese, home	£54 15s. 0d. per ton
Manganese Ore Indian c.i.f. Europe	
(46%-48%)	68d./70d. per unit nom.
Brass Wire	2s. 9½d. per lb. basis
Brass Tubes, solid drawn	2s. 2½d. per lb. basis

* Ex-government stock for prompt delivery from December 17.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Stock markets began the week quietly although the volume of business remained considerable. Later, with the opening of dealings for the new account, a burst of strength developed. Gilt-edged turned downwards; this was mainly due to slightly higher money rates and also to the easier trend of sterling abroad and an overall revenue deficit which was the worst for some time past. The Treasury announced important changes in the handling of bearer securities during the week. The new regulations, which come into force on January 10 will mean much less work and form filling in city offices and banks.

Kaffirs found little support and finance house shares were generally marked down despite the better returns and figures being announced. The Consolidated Goldfields report kept these shares steadier than most. Vereeniging Estates were the only good features. The high return obtainable on this first-class stock attracted buyers.

Among individual Rand mines, there was selective support for some of the older properties, mainly based on recent results. Talk of a higher gold price has definitely taken a back seat for the time being. Beneficiaries from this trend were Crown Mines, Geduld, Grootvlei, Marievale and Vlakfontein. Geduld was favoured as the company's investments are estimated at some 70s. a share apart from the property itself which probably has a life of about ten years. Higher distributions caused a jump in Robinson Deep, and Simmer and Jack remained a steady market for the same reason. The maiden dividend from Stilfontein caused an initial gain in price which was not held. The good results from West Driefontein came up to market expectations, but the shares turned easier following the announcement.

The Orange Free State section was the chief loser despite Mr. Annan's optimistic review. A trickle of selling and no buyers in sight brought about a general marking down of prices.

West African gold shares suffered from lack of interest and prices generally lost the turn. An exception was Bremang which remained steady on the much improved monthly returns.

Elsewhere, Lake View and Star hardened after being quoted

ex dividend and buyers also came in for some of the Indian mines and St. John d'El Rey.

Diamonds and platinum were under the influence of the Kaffir market and even the higher profits and maintained distribution by Consolidated Diamond Mines of South West Africa failed to stimulate interest.

Coppers were much better despite the easier trend in the metal price. Market circles suggest that selling by weak holders in anticipation of labour troubles has finished and the reappearance of bargain hunters caused a sharp reaction. Rhodesia Katanga however, went over 14s. in anticipation of a favourable announcement from the meeting. There was little interest in Selection Trust after the shares were quoted ex dividend.

Tin shares were quiet, the few improvements being mainly influenced by recent dividend results.

Lead/zinc shares hardened with Barriers in the lead. Encouragement was received from the higher zinc price and the quietly steady lead market. Rhodesia Broken Hill were bought in anticipation of the interim dividend. No distribution of capital from Trepca can be expected until the Pasic claim has been settled in Yugoslavia. The board intend to take action to obtain a quick decision.

Among miscellaneous base metal shares, there were two main features—one good and one bad. Consolidated Murchison jumped following the unexpectedly large increase in the final dividend. The company are paying 230 per cent for the year compared with 60 per cent for 1953. Associated Manganese fell heavily due to the passing of the dividend. The company has been forced to stockpile ore at the mine due to inadequate rail transport and the directors have felt obliged to conserve assets.

Canadians were down following the easier trend on Wall Street. Noranda were an exception, apparently due to the buoyant conditions on the copper market. Profit taking lowered International Nickel from their recent high level.

FINANCE	Price Dec. 15	+ or - on week	RAND GOLD contd.	Price Dec. 15	+ or - on week	DIAMONDS & PLATINUM	Price Dec. 15	+ or - on week	TIN (Nigerian and Miscellaneous) contd.	Price Dec. 15	+ or - on week
African & European ..	3 1/2	—	W. Rand Consolidated ..	51/3	—1/3	Anglo American Inv. ..	24/-	—9d	Gold & Base Metal ..	2/10 1/2	+1 1/2d
Anglo American Corp. ..	23 1/2	—1/10	Western Reefs ..	46/3	—2/6	Cas ..	6 1/2	—	Jantar Nigeria ..	7/9 xD	—
Anglo-French ..	26/3	—1/3	O.F.S. GOLD			Cons. Diam. of S.W.A.	5 1/2	—	Jos Tin Area ..	14/6	—3d
Anglo Transvaal Consol.	40/-	—2/6	Freddies ..	6/3	—9d	De Beers Defd. Bearer ..	17 1/2	—	Kaduna Prospectors ..	2/7 1/2	—
Central Mining (E.I. shrs.)	57/6	—7/4	Freddies Consolidated ..	16/9	—1/3	Pots Platinum ..	9/-	—	Kaduna Syndicate ..	2/6	—
Consolidated Goldfields	46/10 1/2	—5/-	F.S. Geduld ..	5 1/2	—	Waterval ..	15/-	—	London Tin ..	6/6	—
Consol. Mines Selection	3/-	—1 1/2d	Geoffries ..	17/3	—1/-				United Tin ..	3/1 1/2	—1 1/2d
East Rand Consols.	5 1/2	—	Harmony ..	38/-	—2/-						
General Mining ..	9/10 1/2	—	Loraine ..	13/9	—1/3	COPPER			SILVER, LEAD, ZINC		
H.E. Prop.	45/-	—2/-	Lydenburg Estates ..	24/4 1/2	—1/10 1/2	Bankroft ..	29/4 1/2	—	Broken Hill South ..	53/9	+3d
Johnnies ..	3 1/2	—	Merriespruit ..	12/3	—	Chartered ..	96/3	—	Burma Corporation ..	38/- xD	+1 1/2
Rand Mines ..	43/1 1/2	—1/3	Middle Wits ..	18/9	—	Esperanza ..	5 1/2	—1 1/2d	Consol. Zinc ..	6/10 1/2	—1 1/2d
Rand Selection ..	31/6	—1/3	Ofsits ..	76/10 1/2	—1/10 1/2	Messina ..	11 1/2	—	Lake George ..	44/6	+3d
Union Corporation ..	4 1/2	—	President Brand ..	72/6	—2/-	Nchanga ..	79/9	—	Mount Isa ..	36/3	+9d
Vereeniging Estates ..	38/9	—2/-	President Steyn ..	44/3	—	Rhod. Anglo-American	13/6	—	New Broken Hill ..	66/3	+1/3
West Wits ..	43/9	—	St. Helena ..	27/6	—	Rhod. Katanga ..	24/9	—	North Broken Hill ..	12/-	+10 1/2d
			Virginia Ord.	29/-	—	Rhod. Selection ..	30 1/2	+1 1/2	Rhodesian Broken Hill	22/9	+9d
			Welkom ..	5 1/2	—	Rhokana ..	38	—	San Francisco Mines ..	4/4 1/2	—1 1/2d
			Western Holdings ..	2/6	—	Rio Tinto ..	20/3	—	Uruwira ..		
						Roan Antelope ..	67/6	—			
						Selection Trust ..	5 1/2 xD	—			
						Tanks ..	7 1/2	—	MISCELLANEOUS		
						Tharsis Sulphur Br.	7 1/2	—	BASE METALS & COAL		
									Amal. Collieries of S.A.	48/9	—
									Associated Manganese ..	32/9	—7/3
									Cape Asbestos ..	11/10 1/2	—7 1/2d
									C.P. Manganese ..	43/-	—3d
									Consol. Murchison ..	58/1 1/2	+7 1/2d
									Natal Navigation ..	2 1/2	—
									Turner & Newall ..	99/- xD	+3d
									Wankie ..	17/10 1/2	+1 1/2d
									Witbank Colliery ..	4 1/2	—
									CANADIAN MINES		
									Dome ..	\$31	—
									Hollinger ..	\$100	—
									Hudson Bay Mining ..	\$105 1/2	—3 1/2
									International Nickel ..	\$6 1/2	—
									Mining Corp. of Canada	\$158	+2
									Noranda ..	\$7 1/2	—
									Quebec ..	\$3/6	—1 1/2d
									Yukon ..		
									OIL		
									Anglo-Iranian ..	18 1/2	+ 1/2d
									Apex ..	29/- xD	—6d
									Attock ..	50/-	+1/3
									Burmah ..	6	—
									Canadian Eagle ..	43/-	+4 1/2d
									Mexican Eagle ..	23/-	—
									Shell ..	6 1/2 xD	—
									Trinidad Leasehold ..	28/6	—9d
									T.P.D. ..	28/3	—1 1/2d
									Ultramar ..	31/-	—93

COMPANY NEWS AND VIEWS

Mr. Annan's Optimistic Outlook

Commenting on the progress which has been made in opening up new mines on the Western Rand and in the Orange Free State, Mr. Robert Annan, chairman of The Consolidated Gold Fields of South Africa, in his statement to shareholders said that he believed that the achievements in these fields in the last eight or nine years had been unequalled in any other mining area. Although it is unwise to lay too great an emphasis on results over short periods—whether they be good or bad—the final prospect remained as bright as ever. As he has stressed often before, working costs, under the new conditions, in terms of the tonnage mined, will not be comparable with those of the older mines. The vital factor is the cost of producing an ounce of gold and it is by this criterion that future progress should be measured.

General conditions as regards labour relations continue to be good. And measures to improve conditions of employment and to attract more African labour to the mines has had a considerable measure of success. At June 30, 1954, an increase of more than 30,000 over the previous year's figure was recorded while the subsequent seasonal decline has been smaller than usual. But these improvements have given renewed emphasis to the shortage of European personnel, particularly for underground supervision. Although a small increase in this sphere has been achieved, numbers are insufficient for the industry's needs and special efforts are being made to improve recruitment.

Of particular interest was Mr. Annan's view that recent improvements in market conditions in O.F.S. shares had lifted prices to more satisfactory levels. Last year he referred to these shares as being undervalued, but in his present statement he commented that the field as a whole was now assessed on a much more realistic basis. This view, together with the fact that he estimates that gold production from the new field may be expected to increase tenfold or more in the next four or five years from the past year's level of 660,000 oz. stands out as a factor of great importance.

This latter possibility is perhaps of particular interest to investors especially in view of the high hopes in regard to the area in the centre block of the O.F.S. which is generally thought to contain deposits of exceptional enrichment. Indeed, if a total of 6,600,000 oz. of gold—or more—is to be produced within the next four or five years from say eleven mines milling a total tonnage in the region of 15,000,000 tons per annum, there would appear to be room for the richest of the mines to mill a grade as high as or even higher than 20 dwt.

Rand Dividends Show Many Increases

Due to technical and other factors at present overshadowing the South African gold market as a whole, the latest batch of December half-yearly dividends have caused no great stir in share prices, though the payments have been regarded as most satisfactory. Indeed, it is a very long time since so many increases were published, nearly half of the companies having raised their distributions. About the same number maintained the previous payments and there was only one decrease, Sub Nigel. As we go to press, returns from Johannesburg Consolidated have yet to be declared.

The prospect of better profits in the industry have, however, been apparent for some time owing to the improved labour and power supply position and also because of the higher price of gold in recent months.

Taking the groups as a whole, the increases ranged between 1d. and 6d. per share but Geduld Proprietary showed the remarkable gain of 1s. 3d. over last June's distribution. This rise was, of course, dependent to some extent upon better payments by Grootvlei and East Geduld which shares the company holds in its portfolio, but even so, the liberal increase is a little difficult to understand. The tonnage treated by the mine in the first eleven months of the current financial year fell to 1,026,000 tons (1,035,000 tons) from which 177,408 oz. were recovered compared with 164,734 oz. previously. Working profits for the eleven months showed a slight decline at £330,700 from £337,900 previously. Moreover, development during the first three quarters of the year showed payability more than halved with average values at 218 in. dwt. compared with 230 in. dwt. in the corresponding period of 1953. On the other hand, the mill grade rose to 3.3 dwt. per ton as against 3.2 dwt. per ton, but costs also rose.

In view of these figures the reason for the increased distribution might lie in improved development results during the last ten weeks or so. It could easily prove that the increased

distribution was made in the light of future prospects, but confirmation must await the publication of the December quarterly results due next January. Meanwhile, the better trend of profits earned during the last two months should also be borne in mind.

The higher payments from Robinson Deep and Simmer and Jack are stated to include cash receipts from sales of property.

The list is also notable for Stilfontein's entry with a maiden dividend of 6d.

Company	June 1953	Dec. 1953	June 1954	Dec. 1954
Central Mining	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Blyvoor*	1 4	1 4	1 2	1 2
City Deep	6	6	6	6
Consolidated Main Reef*	1 9	1 9	1 9	2 0
Crown	2 6	3 0	3 0	3 6
Durban Deep	1 9	1 9	1 6	1 6
E. Rand Prop.	1 9	1 9	1 9	1 9
Modder East*	1 6	1 6	1 6	1 6
Rand Mines	3 0	3 0	3 0	3 0
Transvaal Gold	6	9	6	6
Goldfields				
Libanon*	3	3	3	3
Luipaards Vlei*	7½	7½	7½	7½
Rietfontein Con.	1 3	1 4½	1 3	1 3
Robinson Deep	9	9	1 3	1 9†
Simmer	4	4	3	5½‡
Sub Nigel*	4 0	3 9	3 9	3 6
Venterspost*	5	5	5	6
Vlakfontein	6½	6½	6½	7½
Vogels	1 1½	1 1½	1 6	1 6
W. Driefontein*	6	9	1 3	1 9
Union Corporation				
East Geduld	1 9	1 9	1 9	2 0
Geduld	5 9	5 9	5 6	6 9
Grootvlei	1 2	1 1	1 0	1 1
Marievale	10	11	11	1 1
General Mining				
S. Roodepoort*	9	9	9	9
Stilfontein	—	—	—	6
W. Rand Cons.	1 9	2 0	1 9	2 0
Anglo Transvaal				
Rand Leases*	4½	3	4½	6
Village M.R.*	1.8	1.5	1.5	1.5

* Companies ending their financial years in June

† Including 6d. additional payment

‡ Including 1½d. additional payment

Kennecott to Subscribe for Merries Loan Stock

It is announced by Merriespruit (O.F.S.) Gold Mining Company that it has been decided not to offer the outstanding £2,000,000 of the £5,000,000 three per cent unsecured convertible loan stock recently created, to ordinary stockholders but that the Kennecott Copper Corporation in accordance with its original undertaking will subscribe for this remaining balance. On completion of this arrangement Kennecott will own the entire loan stock. The loan stock is convertible as to 40 per cent in shares at 12s. 6d. until the end of 1958, at which price the company's shares currently stand. Merriespruit is expected to reach a gold production stage during next year and it is expected to start pumping uranium concentrates to the adjoining Virginia mine's plant by about the end of that year.

Lydenburg Platinum Earns More, Pays More

Due mainly to the higher dividends received from Waterval (Rustenburg) Platinum Mining Company during the year ended June 30, 1954, total revenue earned by Lydenburg Platinum rose to £126,655 as against £113,872 in the preceding period. After taxation and expenses, dividends of 15½ per cent were paid (14 per cent) on the company's issued ordinary capital of £750,000 in shares of 5s., and absorbed £116,250 (£105,000). Unappropriated profits carried forward fell to £5,094, compared with £8,808 previously.

In addition to the company's holding in Waterval, shares are held in President Brand Gold Mining Company and Free State Geduld Gold Mining Company. Quoted investments were shown on the balance sheet at £516,622 but had a market value as at June 30, of £1,813,348. In addition various mineral rights in the Orange Free State and unquoted shares are also held. Mr. C. S. McLean is chairman. Meeting was held in Johannesburg, December 3.

Rhokana to Produce Uranium

At the annual meeting of Rhokana Corporation it was disclosed that arrangements are being made with the United Kingdom Atomic Energy Authority under which Rhokana Corporation will mine uranium ore from the small deposit on its property. Accordingly, a plant is to be erected to treat uranium ore and the resulting product will be bought by the A.E.A. at a price based on cost plus a reasonable profit. It was stressed, however, that the deposit was a small one, and that profits therefrom were expected to be quite insignificant in relation to total profits of the company.

Three Tronoh Malayan Tin Group Companies Propose Scrip Issues

It has been proposed that three companies in the Tronoh Malayan Tin group should make scrip issues by way of capitalization of reserves. The companies concerned are Tronoh Mines, Malayan Tin Dredging, and Southern Malayan Tin Dredging.

In the case of Tronoh Mines the capitalization of £700,000 is recommended. Shareholders would receive, therefore, seven new fully paid shares of 5s. each for every three shares held on January 11. From capitalization of £1,009,167 by Southern Malayan shareholders would receive seven new fully paid 5s. shares for three held on January 10, 1955. While Malayan Tin Dredging proposes to capitalize £600,000 which would involve issuing two new fully paid shares of 5s. for each 5s. share held on January 10.

The new shares of the above companies would not rank for any dividend which may be declared this month, but would be in all other respects *pari passu* with shares already in issue. The consent of H.M. Treasury to the proposed issues has been obtained.

Kepong's Drop in Grade

As forecast by Mr. J. H. Rich, the chairman of Kepong Dredging Company, there was a sharp decrease in the grade of ground dredged during the year ended June 30, 1954. In addition to this, the average tin metal price during the year fell by £243 per ton to £640. The combination of these adverse factors resulted in a loss being made by the company.

Year to Treated	Per cu. yard	Output	Tin ore proceeds
June 30	Cu. yds.	Yield	Cost
(000)	lb.	s. d.	tons
1954	970.6	.57	2 1
1953	914.4	.91	2 8
			248
			372
			91,086
			179,870
			1,653
			3,571

Partly owing to the greater number of cu. yds. treated, mining costs fell by £20,818 but also included in this figure was the credit of £5,512 in respect of dredge replacement over provision written back.

Year to	Total	Mining	Taxa-	Net	Divi-	Carry
June 30	Revenue	Costs	tion	Profit	dend	Forward
	£	£	£	£	£	£
1954	98,693	101,862	2,124	Dr.11,617	NIL	13,474
1953	191,547	122,680	39,136	23,656*	14,512	21,035

* Before £10,000 written off property account.

As regards the future, the average value of ground worked during the current year is about the same as that of the previous year, but in view of the higher price for tin metal a modest mine profit is being made. If the present price continues and if the company's hopes of an increase in the yardage treated as a result of the installation of a new clay cutter are fulfilled, mining profits should increase accordingly. On the other hand, should the new cutter not come up to expectations the advisability of closing down the dredge and letting out the ground on tribute will have to be considered.

Production in respect of the first quarter of the current financial year has resulted in the recovery of 66½ tons of tin ore, as compared with 70½ tons in the previous corresponding period. Kepong 5s. ordinary shares now stand at around 3s. 4d. Meeting, London, December 17.

Meru Produces Less

During the year ended June 30, 1954, a total of 241 tons of tin concentrates were produced by Meru Tin. This compared with 308 tons during the preceding year and was the lowest level of production for the past six years. This disappointing result, said the chairman, Mr. G. A. Williamson, was brought about by the cessation of operations at several of the company's tribute sections due to poor returns, high working costs

and a low price of tin. There was, in fact, a considerable fall in the average Singapore tin price which dropped to £663 per ton as compared with £875 during the previous year.

However, sales of tin ore and tribute receipts during the first quarter of the current financial year show a considerable improvement and have brought in £6,280 as against £5,070 previously. After administration and working expenses of £5,625 (£6,490) an estimated profit of £685 was made as against a loss of £1,420.

While preliminary figures for Meru Tin were given in the *Mining Journal* issue November 26, page 617, the full report and accounts now received shows that total revenue fell to £21,890 as against £38,606 previously. After working and other expenses a loss of £3,859 was made for the year compared with the previous year's profit of £8,586. No dividends were recommended. Meeting, London, December 14.

Jantar's Columbite Contract

It is inevitable at times when the price of any particular commodity reaches an unprecedented high level for rumours or isolated incidents to have a disproportionate effect on public confidence in future price stability. Perhaps a case in point was the termination of Jantar Nigeria Company's columbite contract with the Union Carbide and Carbon Corporation.

Columbium, the metal extracted from columbite ore, is one of the key alloying metals used in producing steel for jet engines, gas turbines and rockets. It is easy to appreciate, therefore, that the metal plays an important part in defence production. It is, of course, because of this that the United States are currently paying a price of £2,000 per ton and more, according to grade, for columbite concentrates—a figure which includes a bonus of 100 per cent offered by D.M.P.A. as an inducement to producers. Somewhat naturally, in view of rumours that demand for the metal is being adequately met, there is currently considerable speculation as to whether this bonus will continue after 1956 at which date the U.S. Government hopes to have completed its stockpile target.

It was in his statement to shareholders of Jantar that Mr. C. A. P. Tarbutt, the chairman and managing director, disclosed the somewhat startling fact that the contract for the company's sale of columbite to Union Carbide and Carbon Corporation—an organization amongst the largest in the U.S.—had not been renewed on its expiry at December 31, 1953. And while there might be many reasons for such a decision, it does appear strange that at a time when the metal is still officially regarded as scarce in the long term outlook this course should be adopted. It was, no doubt, this development which drew forth the warning from Mr. Tarbutt that although the company's columbite production for the remaining nine months of the current financial year had been satisfactorily disposed of, there would come a time when the American Government would cease to pay the bonus, and might eventually stop buying altogether. There was, he continued, little doubt, that in either case the columbite market will for a time become difficult and remain so until supply and demand between commercial users and producers has been adjusted.

Although it would be unwise to ignore this straw in the wind—and it is possible that there may be more to come—in the light of any previous assessment of the columbite position it does appear that any bearish conclusion as to the outlook might be premature. It will be recalled that the U.S. Government stockpile target is 7,500 s.tons by 1956; and although it has since been estimated that the U.S. could possibly furnish in the future about one-fifth of its own annual domestic industrial requirements of columbium, the major part of the target figure remains as yet unprovided. In the absence of a considerable acceleration of production and exploration for the metal in other parts of the world, the balance will have to come from Nigeria, which is by far the world's largest producer.

During the year ended September 30, 1954, Jantar's revenue rose to £517,939 from £257,675 previously. After mining and general expenditure in Nigeria of £179,589 (£144,788) and taxation of £288,650 (£155,745) an amount of £185,558 (£69,610) remained for appropriation after taking into account £165,501 received in respect of columbite bonus for 1952/53 production. Dividends paid on the company's issued ordinary capital of £225,000 in 2s. 6d. units were increased to 85 per cent—including bonus of 25 per cent—from 50 per cent previously. After £70,000 (£25,000) had been placed to general reserve the carry forward rose to £11,987 as compared with £1,547.

During the year production of tin fell to 198 tons (212 tons) while that for columbite rose to 216 tons as compared with the previous period to a total of 210 tons. During the first month of the current financial year 18 tons of tin have been produced

(16 tons) while columbite output was 18 tons or the same as that in the corresponding month of the preceding year. Meeting, London, December 21.

Company Shorts

Transvaal and Delagoa Bay Increases Profits.—Due to higher income from investments, greater profit from properties sold and more remunerative share transactions, profits earned by Transvaal and Delagoa Bay Investment Company during the year ended August 31, 1954, showed a considerable advance on those of the previous year.

Year to Aug. 31	Total* Revenue	Tax- ation	Net Profit	Divi- dends	* To Reserve	Carry Forward
	£	£	£	£	£	£
1954	295,067	39,000	223,465	180,375	50,000	6,003
1953	215,265	4,545	106,195	171,356	210,000	12,913

* Includes £207,243 from subsidiary and other investments (1953—£191,443)

Dividends paid on the issued ordinary capital of £360,750 in shares of £1 amounted to 10s. per share or 50 per cent as compared with 47½ per cent in respect of the preceding period.

A greater output was achieved by the company's wholly owned Douglas Colliery and production for the year totalled 1,417,438 tons as compared with 1,371,984 tons previously. Profit earned after taxation, however, fell to £220,128 as against £237,313 for the previous year. This decrease was caused by the inability of the railway administration to provide an adequate and consistent supply of trucks for the colliery. The dividend of 16s. per share which absorbed £180,000 paid to the parent company remained unchanged.

Natal Coal's Dividend Prospects.—The production of coal on a commercial scale began at Natal Coal Exploration Company's colliery at the beginning of October, 1953. The report and accounts for the year ended June 30, 1954, therefore, represent only nine months' operations. During this period a net profit of £59,931 was earned and after amounts written off of £39,151, unappropriated profit carried forward was £20,767.

It is hoped, provided that there is no further deterioration of the South African railways transport position, that the company will soon commence dividend payments on a modest scale. Mr. T. Coulter is chairman. Meeting, Johannesburg, November 26.

Cam and Motor Expects to Maintain Profits.—An interesting point which arose from the statement to shareholders of Cam and Motor Gold Mining Company made by Mr. H. N. Clackworthy, the chairman, was that the average monthly profit of £40,000 is expected to be maintained, despite last year's milling grade having been exceptionally high. During the year the gold content of ore milled rose to 7.22 dwt. per ton as compared with 6.38 dwt. previously. This was due, however, to the reclamation of pillars between the 23rd and 30th levels which contained gold in amounts greater than the ore reserve average. In addition, the normal mining programme resulted in the extraction of a rather larger proportion of higher grade ore reserves than was usual. This will not recur in the current year.

Trepca Not Yet Considering Capital Return.—Owing to the continued existence of the Pasic claim against Trepca Mines, said Mr. Chester Beatty, Jr., at the meeting last week, the company was unable as yet to make a capital distribution. As soon as the difficulties are overcome, the matter will, however, be reconsidered.

Mr. Beatty went on to disclose that of the £4,500,000 compensation to be paid by the Yugoslav Government in respect of all British property which was nationalized, a total of £2,980,000 will have been received when this month's instalment is to hand.

Rahman Hydraulic Earns Less, Pays Less.—Operations carried out by Rahman Hydraulic Tin during the year ended June 30, 1954, brought in the very much lower net profit of \$136,013 compared with \$523,776 previously. A dividend of 10 per cent (20 per cent) was paid on the issued ordinary capital of \$2,000,000 in shares of \$1 each which absorbed \$140,000 (\$280,000). The company's carry forward was decreased to \$263,630 as against \$284,449 previously.

Temoh's Sharp Fall in Profit.—As forecast by the chairman of Temoh Tin Dredging, Mr. R. Ellerton Binns, profits earned by the company during the year ended June 30, 1954, suffered a serious setback. This was due particularly to a loss of production from tributors who had to change over from the company's exhausted South Section to the new area in the south east which did not come into production until January, 1954. In addition, mining in the north west section was retarded owing

to tributors being forced to re-site their palong. Besides these difficulties the lower price received for tin also had a serious effect on profits.

Year to June 30	Total* Revenue	Tax- ation	Net Profit	Divi- dend	To Reserve	Carry Forward
	£	£	£	£	£	£
1954	7,990	2,503	181†	3,850	Nil	6,999
1953	31,480	8,524	16,770	9,625	2,213	11,475

* Including tribute and rents £5,500 (1953—£28,877)

† Before £807 Capital reduction expenses written off

Dividends of 10 per cent was paid on the issued ordinary capital of £70,000 in stock units of 10s. In the preceding year 12½ per cent was paid on the previous capital of £14,000.

In regard to the current year's operations Mr. Binns reports brighter prospects. Both sections of the property are now in full production, and outputs to date can be regarded as satisfactory. Moreover, with the recovery in the tin price, materially better results should be the outcome of the current year's operations. Meeting, London, December 22.

Ribon Valley Earns Less, Pays Nil.—Due to the sharp fall in tin prices total revenue earned by Ribon Valley (Nigeria) tin-fields during the year ended March 31, 1954, fell to £61,641 compared with £72,142 previously. After Nigerian expenditure of £38,523 (£39,006), tin realization charges of £12,914 (£18,350) and other expenses, of which taxation was £266 (£4,139), the net profits fell to £872 as against £2,451. An amount of £6,688 was carried forward compared with £7,253 previously. No dividend was paid on the issued ordinary capital of £131,000 in 2s. units as against 5 per cent previously.

Production of tin concentrates during the year rose to 121 tons with an average content of 74.36 per cent as compared with 116 tons averaging 74.11 per cent in the previous year. The average price received for tin metal dropped by £144 per ton from the preceding year's level to £675 per ton but on the other hand working costs in Nigeria at £425 per ton of concentrate, showed a decrease of £69. Ore reserves at March 31, 1954, amounted to a total of 3,037 tons.

Production in respect of the current year to October shows that in comparison with the previous corresponding period output of tin has fallen to 67½ tons as against 80 tons. On the other hand 6.34 tons of columbite has been produced from the company's newly acquired Odegi columbite-bearing areas. Mr. A. Hedley Williams is chairman. Meeting, London, December 15.

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG, SOUTH AFRICA CHAMBER OF MINES CHAIR OF MINING ENGINEERING

Applications are invited for appointment to the post of PROFESSOR IN MINING ENGINEERING, who will be Head of the Department of Mining.

The substantive salary attached to the post will be as arranged between the successful applicant and the University, but will not be less than £3,000 per annum. In addition, a married man will receive cost of living allowance at such rate as may be authorized from time to time, the present rate being £234 per annum.

Membership of the University Institutions' Provident Fund is compulsory and involves a contribution of seven per cent of the pensionable salary, the Government and the University together contributing an equal amount. The pensionable salary is at present £1,600 per annum. Membership of the University's Staff Medical Aid Fund is also compulsory in the case of an officer who is eligible for such membership, and contributions will be in accordance with the rules of the Fund.

The Professor will be called upon as part of his duties to serve as a Consultant to the Transvaal and Orange Free State Chamber of Mines. He will not, except under special circumstances, be granted permission to engage in private consultative work.

Duties are to be assumed on July 1, 1955, or as soon as possible thereafter.

Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 5 Gordon Square, London, W.C.1.

The closing date for the receipt of applications, in South Africa and London, is January 31, 1955.

THE CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA

MR. ROBERT ANNAN'S REVIEW

The annual general meeting of Consolidated Gold Fields of South Africa Ltd. was held on December 9 in London.

Mr. Robert Annan, chairman of the company, who presided, in the course of his speech said:—

Turning first to the Accounts of the operating company, New Consolidated Gold Fields Limited, the Working Profit for the year amounted to £1,618,000. The principal contribution was made by dividends and interest on our investments, which at £1,226,000 maintained the record achieved last year, a reduction in dividends from our base metal interests having been offset by increased dividends from our gold holdings. Profit on realization of investments and Sundry Revenue rose to £557,000 while an increase in fees received resulted in the lower figure of £165,000 for net administration expenses.

In the Union of South Africa the gold mining industry has made substantial progress during the past year.

INCREASED GOLD PRODUCTION

Gold production increased as a result of a larger tonnage milled with a higher yield, but total profits declined owing to higher operating costs and a fall in the price received for gold. A statement of this nature, covering the industry as a whole, does not convey an accurate picture of the progress being made and of the changes which are taking place. The total gold production of the industry is now over one million ounces a month. Of this one-fifth is being produced at a cost of 157s. an ounce by new mines which have started production in the last three years, while production from the older mines is costing 196s. 1d. an ounce.

Regarding general conditions affecting the industry, labour relations continue to be good.

The mines under our own administration have had a successful year. The figures for tonnage milled, gold produced, and working profit all reached new records for the group. Doornfontein was added to the list of producing mines and, together with increased production from West Doornfontein, contributed to this result. The contribution from these two mines also accounts for the fact that the group cost of gold production was lower by approximately 3s. 6d. an ounce.

In the Orange Free State the Harmony mine, in which we have a substantial interest, has now come into production and its development continues to be most encouraging.

On the adjoining Saaiplaas area, drilling during the year by our Free State Exploration Company gave most encouraging results, intersections of the Basal Reef in Borehole DS.3, disclosing values of 580 and 908 inch-dwt. The exploratory drilling programme has now been completed and has delimited an area suitable for a mining lease for which application is being made. On the grant of a lease a new company will be formed for which capital subscription rights will accrue to our Free State Exploratory Company and to the other interested parties.

During the past year we have increased our holdings in others of the most promising mines now operating and developing in the Free State.

Rapid progress has been made by the industry in the erection of plants for the extraction of uranium. Out of fourteen plants planned to serve twenty-three companies, six were in production at June 30 last, and the figures already published indicate that when all the plants are in production the total profits earned from uranium will be substantial in relation to the profits from gold.

In our own group the uranium plant at Luipaards Vlei is now on trial runs and should be on a production basis early in the New Year.

We have maintained our interest in the platinum industry, from which we derive a very substantial revenue.

Exploration for new ore-deposits is being carried on continuously by our technical staff on a considerable scale and special study is being made of new methods and aids to prospecting. Competition is keen and easily recognizable deposits are becoming increasingly rare. We are using the most modern equipment and methods, which are essential to success.

The Golds Fields American Development Co. Group again made a satisfactory profit. Tri State Zinc Inc. and Buell Engineering Co. Inc. continue to do well. The former is a low cost producer which can still earn profits at the reduced price of the metal while Buell Engineering continues to enjoy a good demand for its specialized equipment for the collection of industrial dusts.

The report and accounts were adopted.

LONDON AND RHODESIAN MINING AND LAND CO., LTD.

The Annual General Meeting of the London and Rhodesian Mining and Land Company, Limited, was held at 20 Aldermanbury, London, E.C.2, on December 10.

Sir Joseph Ball, K.B.E. (Chairman and Managing Director) who presided, in the course of his speech said:—

The gross profit for the year ended June 30, 1954, amounted to £151,658, and, after providing for taxation amounting to £90,233, the net profit for the year was £61,425.

Your Directors now recommend the payment of a final dividend of 1½ per cent, less tax, making a total of 7½ per cent for the year as compared with dividends of 6 per cent paid during the previous three years, and 5 per cent during the preceding eight years. In addition to the final dividend of 1½ per cent in respect of the year under review, your Directors have also declared an interim dividend of 3½ per cent, less tax, in respect of the year to June 30, 1955.

The figure relating to investments in our subsidiaries shows an increase during the year of approximately £121,000, which is accounted for mainly by the Company's investment in Mazoe Consolidated Mines Limited. Our Company now holds 121,000 shares of the par value of £1 per share out of the total issued capital of £128,723, the entire balance being owned by a Company which has for years been closely associated with us, viz. Union and Rhodesian Mining and Finance Company Limited.

SABI VALLEY: Since the end of the year under review, the Company has acquired a three months' development option over six blocks of base mineral claims in the upper Sabi Valley. These claims contain a number of base metals, including columbite, tantalite, copper, lead and zinc, although it is not yet known whether deposits of these minerals exist in payable quantities. Prior to Lonrho's acquisition of the option over the property, very little work had been done, but a programme of intensive prospecting development is now in progress, in order to establish whether or not the claims contain sufficient quantities of the various minerals to warrant the exercise of the option. It is estimated that the cost of the prospecting development programme necessary to prove the claims will be approximately £3,000, but there is every reason to hope that during the three months' option period we shall be able to open up enough concentrate-bearing ground to recover our costs, plus the purchase price asked for the property.

With regard to the Company's subsidiaries, I have already supplemented the information given in the Directors' Report with regard to Mazoe Consolidated Mines Limited. In the case of our other subsidiary—African Investment Trust Limited—I would point out that the profit during the year, after providing for taxation, amounted to £12,784, as compared with the figure of £6,380 during the preceding year.

SELECT COMMITTEE ON TAXATION APPOINTED

As shareholders are aware, the Federation of the two Rhodesias and Nyasaland took place during the year under review, and Salisbury is now the Federal Capital; but no decision has yet been reached regarding the siting of the Territorial Capital.

During the year, the Minister of Finance for the Federation introduced the first Federal Budget, which included a reduction in the rate of income tax on companies of 1s. 6d. in the £. This reduction has, however, been largely offset by the introduction by the Southern Rhodesian Government of a surcharge of 1s. 3d. in the £, with the result that the total rate of income tax for Southern Rhodesian companies is now 7s. 6d. in the £. A Select Committee has, however, now been appointed by the Federal Government, and charged with the duty of investigating the whole subject of Federal taxation.

A Parliamentary Committee has also been set up to investigate the possibility of the introduction of some practical form of tax on holdings of undeveloped land. As shareholders know, I have for several years past stressed the undesirability of the indefinite retention of such land by individuals or companies; and, for this reason, whenever opportunities have occurred for selling, at reasonable prices, our own holdings of this type, we have taken advantage of them.

Despite this fact, however, we still hold several hundred thousand acres of land which fall within this category; and with the best will in the world we cannot hope to dispose of it, at fair prices, at short notice. It is much to be hoped, therefore, that the Parliamentary Committee which is looking into this matter, will bear this fact in mind, and will refrain from recommending the imposition of a tax upon holdings which the owners are very ready and willing to sell, but for which they have so far received no adequate offers.

The report and accounts were unanimously adopted.

LAKE VIEW & STAR

SIR JOSEPH BALL'S SPEECH

The Forty-fourth Annual General Meeting of Lake View and Star, Ltd., was held on December 14 at the Chartered Insurance Institute, London, E.C.

Sir Joseph Ball, K.B.E., Chairman of the Company, presided and, in the course of his speech, said:—

As a result of a further rise in gold production the revenue from mining and retreatment operations for the year ended June 30, 1954, showed an increase of £31,538, despite a fall in revenue from gold premium sales of nearly £87,000 as compared with the previous year. Receipts from this latter source virtually ceased with those received in respect of the August/September 1953 production; but the effect was to some extent mitigated by an increase of 2s. 2d. per ounce in the price of gold in Australia, which took place on May 1, 1954, following upon the re-establishment of the gold market in London.

Owing to the increased tonnage milled, working costs rose during the year by £34,979, but it is satisfactory to note that, for the first time for several years, the upward trends in both cost per ton milled and cost per ounce of gold produced were reversed.

The amount available for appropriation this year is £462,603, as compared with £465,596 last year—a decrease of £2,993.

One interim dividend of 9d. per share, less tax, was declared during the year, and absorbed the net amount of £57,750.

After providing £27,162 for depreciation of plant and machinery, there remains, with the balance of £48,003 brought in from last year, an amount of £169,704, out of which your Directors recommend the payment of a final dividend of 1s. 6d. per share, less tax, thus maintaining a total of 2s. 3d. per share for the year, the same as for the previous year. The net final dividend will absorb £115,500, and the carry forward will therefore be increased by £6,201 to £54,204.

DEVELOPMENT

The total development for the year at 25,922 ft. showed a decrease of 2,027 ft. as compared with the figure for the preceding year. Of 16,594 ft. advanced on lodes, 9,380 ft., or 56.5 per cent, averaged 6.0 dwt. per ton over a width of 57 inches.

Although the payable footage and width were lower by 3,318 ft. and 3 inches respectively, the grade was higher by 0.2 dwt. per ton; and there was added to the reserve 763,600 tons of ore, which exceeds the ore milled during the year by 21,000 tons.

The major part of the development was again in the Western Group of Mines, where the payable footage in drives totalled 6,812 ft. or 59.7 per cent averaging 6.1 dwt. per ton over a width of 57 inches. Of this footage, 85 per cent was on the "Minor Lodes" which averaged 6.1 dwt. per ton over a width of 56 inches.

The ore reserve at July 1, 1954, was estimated at 3,756,300 tons averaging 4.8 dwt. per ton, an increase of 21,000 tons and a decrease of 0.01 dwt. on the previous year's figures. Positive and broken ore amounted to 3,444,900 tons averaging 4.72 dwt. per ton or 91.7 per cent of the total ore in reserve.

Ore milled during the year increased by 22,066 tons to a record throughput of 743,911 tons averaging 4.71 dwt. per ton, a decrease of 0.19 dwt. per ton. The gold recovery showed a marked improvement at 90.25 per cent compared with 88.12 per cent for last year. Working costs at 41s. 10d. per ton on the 743,047 tons of Company ore milled were lower by 6d. per ton.

Your Directors have constantly in mind the very important question of mining costs. It is, of course, the case that, for the time being, rises in the basic wage, one of the prime factors in rising costs, have ceased; but they feel that it would be unsafe to rely upon the indefinite continuance of this state of affairs. It is, therefore, mainly to further improvements in the efficiency of mining operations generally that they must look for such further reductions in costs as may be possible; and I can assure you that the Management, both here and in Australia, are fully alive to this situation.

For some time past the Board have had under consideration the provision of a further power unit, as a safeguard against breakdowns and the serious consequences to production which would result. Accordingly, during the past year it was decided to purchase a large power unit which could be put into operation in place of two of the older existing units.

Mr. R. J. Agnew, a director and the general manager in Australia, in seconding the adoption of the report and accounts, said that the mine had never been in a healthier position. He was very happy to be in charge of a mine which had five years' ore ahead of the mill absolutely blocked out. They had had a hard battle with costs but that had been overcome by increasing tonnage and increasing efficiency.

The report and accounts were adopted.

THE CENTRAL MINING - RAND MINES GROUP

DECLARATION OF DIVIDENDS

NOTICE IS HEREBY GIVEN that DIVIDENDS have been declared payable to shareholders registered in the books of the undermentioned Companies at the close of business on December 31, 1954, and to persons presenting the respective Coupons detached from Share Warrants. Dividends on shares included in Share Warrants will be paid in terms of a notice to be published later by the London Secretaries of the Companies.

The dividends are declared in South African currency and become due on January 3, 1955. Payment from the Office of the London Secretaries will be in British currency at par provided that should there be any difference that may be regarded by the Boards as material between the two currencies on January 3, 1955, payment will be made on the basis of the equivalent British currency calculated at the rate of exchange ruling on that date.

Warrants in payment will be posted on or about February 8, 1955, to shareholders at their registered addresses or in accordance with their written instructions. Warrants will be despatched from the Registered Office, Johannesburg, to addresses in Africa south of the Equator and from the Office of the London Secretaries to addresses elsewhere. Instructions which will necessitate an alteration in the Office from which payment is to be made must be accepted by the Companies on or before December 31, 1954. Other changes of dividend instructions to apply to these dividends must be received by the Companies not later than January 26, 1955.

The Transfer Books and Registers of Members will be closed in each case from January 1 to 7, 1955, both days inclusive.

Name of Company (Each incorporated in the Union of South Africa)	Dividend No.	Coupon No.	Dividend Per Share s. d.
Rand Mines, Limited	103	103	3 0
Blyvooruitzicht Gold Mining Company, Limited	18	—	1 2
City Deep, Limited	70	70	6
Consolidated Main Reef Mines and Estate, Limited	90	87	2 0
Crown Mines, Limited	107	107	3 6
Durban Roodepoort Deep, Limited	68	68	1 6
East Rand Proprietary Mines, Limited	70	71	1 9
Modderfontein East, Limited ..	55	36	1 6
Transvaal Consolidated Land and Exploration Company, Limited	32	32	2 0
Transvaal Gold Mining Estates, Limited	88	88	6

By Order of the Boards,
A. MOIR & CO.
London Secretaries
of the above-named Companies.

Office of the London Secretaries:

4 London Wall Buildings, London, E.C.2.

December 9, 1954.

DIVIDENDS

British Insulated Callender's Cables 2½% *i* (January 18)
Consolidated Co. Bultfontein 7.2d. (January 28)
Frontino Gold Mines Pref. 1s.; Ord. *i* 6d. (January 1)
Griqualand West Diamond 2s. 10.2d. (January 28)
Idris Hydraulic Tin 7½% *i* (January 3)
Kinta Tin Mines 10% *i* (December 23)
Malayan Tin Dredging 20% *i* (January 27)
Marshall, Sons and Co. 11½%
Mt. Isa Mines 10% (January 4)
Natal Navigation Collieries 7½% *i*
Pengkalan Pref. and Ord. 15% *i* (January 19)
Powell Duffryn 3% *i* (January 31)
Selection Trust 1s. 6d. *i* (January 22)
Tanjong Tin Dredging 12½% *i* (December 23)
Tekka 1½% (January 8)
Weardale Lead 5%

i interim

MALAYAN TIN DREDGING AND SOUTHERN MALAYAN TIN DREDGING

MR. ERNEST V. PEARCE'S STATEMENTS

The Annual General Meetings of Malayan Tin Dredging, Ltd., and Southern Malayan Tin Dredging, Ltd., were held on December 15 in London.

Mr. Ernest V. Pearce, the Chairman, presided.

The following are extracts from the statements of the chairman circulated to shareholders:—

MALAYAN TIN DREDGING LIMITED

The net profit for the year after providing £234,270 for taxation, amounts to £168,444, making, with the unappropriated balance at June 30, 1953, £220,885, a total credit of £389,329. Dividends totalling 4s. per share have been paid in respect of the year, absorbing £132,000, and £100,000 has been transferred to Reserve Account. The Directors recommend that the remaining balance of £154,011 be carried forward to the current year.

From the Balance Sheet, it will be seen that the Reserve Account now stands at £586,784. Quoted Investments which cost £554,390, had on June 30 last, a market value of £777,400; the Company held £200,000 Tax Reserve Certificates and £203,065 in Cash. Taking Investments at cost the Current Assets totalled £1,315,387 against Current Liabilities of £566,403.

The Export Duty paid to the Government of the Federation of Malaya during the year amounted to £133,633 6s. 6d.

In my last year's address I referred to an application which had been made by Tromal Prospecting Ltd. to the Siamese Government for mining leases to cover the areas which had been prospected and proved to contain payable values. I am pleased to report that these leases, covering an area of approximately 7,500 acres have been granted for a period of 25 years from January 1, 1954.

On the granting of the leases it became necessary to form an operating company to deal with the area and a company entitled Aokam Tin Ltd. has now been incorporated in the Federation of Malaya with an authorized capital of £7,000,000 (Malayan) in shares of \$1 each and steps have been taken to make an initial issue of \$6,000,000.

Out of the initial issued capital of 6,000,000 shares of \$1 each, the Siamese Government have taken up 45 per cent. This Company's proportion is 627,000 Shares, costing £73,150. One half of the nominal amount of the shares has been paid and the balance is payable at the end of this year.

The area covered by the leases is estimated to contain some 49 million cubic yards averaging 1.45 catty, or 1.93 lb. per cubic yard and to have a total content of 710,500 piculs or 42,292 tons of tin concentrates worth, with tin at £600 per ton, about £15,000,000. The tin values are contained in a deposit averaging about 15 feet thick at a depth in the sea of from 60 to 70 feet. Operations will be carried out by grab-dredging, a method in common use for river and harbour dredging. Conservative estimates of cost indicate that after allowing for amortization over the duration of the leases, there should remain an annual mine profit, with a tin price of £600 per ton, equivalent to 37 per cent on a capital of \$6,000,000.

We have examined certain areas of the sea-bed off the coast of Malacca with, I regret to say, negative results.

If Malaya is to retain her position as a large tin producer it is essential that every encouragement be given to prospecting, for unless new payable areas are developed to take the place of those already exhausted or nearing exhaustion it is clear that production will seriously decline.

If, as is generally accepted, the future of the industry in Malaya is to depend upon the successful exploitation of deep low-grade areas the urgent necessity for prospecting is apparent.

Subject to ratification by the Governments of the participating countries a new agreement will in due course come into force.

The effect of such an agreement on existing undertakings and on the development and equipment of any new properties remains to be seen.

During the year under review the Sterling Equivalent of the Singapore dollar price of tin has shown wide variations the highest being £756 10s. per ton on April 13, 1954, and the lowest £552 10s. on August 4, 1953. Compared with the average price during the preceding year there was a decline of some £243 per ton and it was this factor which was responsible for the decrease of £288,000 in our receipts as shown in the Profit and Loss Account.

During the first four months of the current year the price has averaged £718 15s. per ton.

For some time your Directors have been considering installing a new large dredge, similar to No. 3A, on the Kampong Gajah Area, where we have sufficient ore reserves to justify the installation

of two machines.

The cost of one such dredge would be in the region of £700,000 or £750,000 and it would probably be three years from the date of placing the order before it could commence operations.

In view of the new International Tin Agreement we manifestly cannot embark on such an expenditure unless we are certain that we shall be able to obtain an assessment covering its estimated production, and steps have already been taken with a view to ascertaining where we stand in this connection.

CAPITALIZATION OF RESERVES

With a view to bringing the Company's issued capital into closer relationship with the capital employed in the business the Directors have decided to recommend the capitalization of £600,000 of the Reserves, and to make a free issue of two fully paid Ordinary Shares of 5s. each for each 5s. Share held.

The necessary Extraordinary General Meeting of the Company will be convened early in the New Year.

SOUTHERN MALAYAN TIN DREDGING LTD.

The net profit for the year after providing for taxation a net sum of £323,448 amounts to £368,439, making with the balance unappropriated at June 30, 1953, £174,523, a total credit of £542,962. Dividends totalling 4s. per share have been paid in respect of the year, absorbing £190,300, and the sum of £276,137 has been transferred to General Reserve which now stands at £980,000. The Directors recommend that the remaining balance of £76,525 be carried forward to the current year.

Total receipts for the year have declined by £507,474. Of this some £495,000 is accounted for under the items "Sales and Stock of Tin Concentrates" and "Tribute" and this decrease is due to the fall of about £243 per ton in the price of tin as compared with the previous year, coupled with a decline of about 112 tons in the year's production of tin concentrates.

The decline of about £12,000 in the item Sundry Revenue at Mine was due to a decrease in sales of Ilmenite from our Amang Dumps. It has been decided to install an electrostatic separator in order to recover not only Ilmenite but other valuable minerals from the Amang, sales of which have accordingly been withheld in the meantime.

The sum of £212,550 4s. 6d. was paid during the year to the Federation Government in Export Duty.

In my address to the Shareholders of Malayan Tin Dredging Ltd. I have referred to a new Company—Aokam Tin Ltd.—which has been formed for the purpose of operating in the sea off the coast of Siam.

As the interests of your Company are identical in every respect with those of Malayan Tin Dredging Ltd. I ask you to refer to the remarks I have made on this matter in my address to that Company's Shareholders.

RESEARCH

Once again I wish to mention the very valuable work that the Tin Research Institute is doing towards developing new uses and improving existing uses for tin.

An increasing number of the methods devised by the very efficient staff of the Institute is being adopted by manufacturers who everywhere are displaying the greatest interest in the Institute's developments.

CAPITALIZATION OF RESERVES

With a view to bringing the Company's issued capital into closer relationship with the capital employed in the business, the Directors have decided to recommend the capitalization of £1,009,167 of the Reserves, viz. the General Reserve of £980,000 and £29,167 out of the Capital Reserve by the free issue of seven fully paid Ordinary Shares of 5s. each for every three Shares of 5s. each held.

Approval of this course has been given by the Capital Issues Committee and the necessary Extraordinary General Meeting of the Company will be convened early in the New Year to consider the Board's recommendations.

Experienced SENIOR METALLURGIST required to take charge of 1,000 ton per day Reduction Mill at Gold Mine in the Gold Coast Colony. Candidates must have a University Degree or Diploma of a recognized School of Mining. The salary offered will be commensurate with the successful candidate's experience and qualifications, with a minimum of £130 per month. Continuous contract with fifteen months' tour and three months' leave. Passage paid both ways. Free quarters and medical service. A Provident Fund is in operation. Low income tax. Applications, stating age, training and experience, to Box No. 265, Walter Skinner Ltd., 20 Copthall Avenue, London, E.C.2.

HARRISONS & CROSFIELD, LIMITED**SIR ERIC MILLER'S SPEECH**

The Forty-sixth Annual Meeting of Harrisons & Crosfield, Ltd., was held on December 13 in London.

Sir Eric Miller, the Chairman, in the course of his speech, said: Britain's ultimate goal must remain free convertibility of sterling, but she cannot afford serious mistakes on the way. Hence a policy of 'festina lente,' trying by the G.A.T.T. and other means to promote wider trading confidence, so that flights from one currency to another may no longer present attractions to exchange adventurers, seems the only right one for our Government.

The Group Net profit attributable to the Parent Company after all charges and taxation was £588,773. Of this figure net dividends absorb £187,165, and £401,608 is retained in the business. The Deferred Ordinary dividend is 20 per cent.

In the course of his review of the tea industry, he said: The gradual improvement in tea prices during 1953 rendered it possible for almost all estates to resume production, albeit with every possible economy in capital expenditure. With increased consumption not only in the United Kingdom but in world markets, except for slight seasonal variations, the primary markets and London registered a progressive advance: Clean Common Broken Pekoe, the yardstick by which the London market has been assessed for many years, was quoted last week at an all-time record figure of 6s. 6d. per lb., almost double the figure of a year earlier. The rapid advance in auction prices has inevitably rendered it necessary for packers in the United Kingdom and elsewhere to increase their retail prices. There has been a certain amount of somewhat ill-informed comment in the Press and elsewhere during recent months by those who seem to be unaware that current levels are desired by neither producers nor blenders.

TEA PRICES

The fact that for some months wholesale prices in the London auctions have been above the price level of the average run of retail packets available to the consumer is indisputable evidence that distributors are doing what they can to defer a further rise in retail prices.

Given reasonable weather and satisfactory working conditions, production in India and Ceylon, which already between them are responsible for more than 75 per cent of the total available world supplies of tea, is capable of expansion to the extent required to bring about the desired balance between supply and absorption.

Although it is hoped and desired that there may be some easing of current price levels, this is not likely to occur until it is clear that 1955 world production of tea will be adequate for all requirements.

RUBBER

Dealing with the rubber industry, he said: At the date of our last meeting the price of Spot Sheet in London was about 17½d. per lb., following which it drifted down to below 16d. in the early days of March 1954, causing acute concern in all producing territories.

The urge for improved facilities for the transport of passengers and goods by road is world-wide. More and better roads are a pressing need, as we know in this country, where at long last the powers that be are making a move, though on a pathetically inadequate scale. If only the large sums collected annually in taxation on Road Vehicles had been left available to the Road Fund for the improvement of our road system generally, as was, I believe, the original far-sighted intention, the moneys so applied would have been really well invested. The latest improvement in tyres is the tubeless tyre which manufacturers expect will become standard.

You all know how foam rubber is going ahead for upholstery in cars and in the home; it is entrenching on some of the older methods of cushioning but the price factor comes into the picture when considering probable future expansion. Much money and talent is being devoted to the improvement of the synthetics both in performance and in methods of production.

Referring to competition between Natural and Synthetic rubber, he said: The Synthetic people will go on straining every nerve to improve their product and reduce costs. We on our side must continue the good work of breeding yet higher-yielding clones and of replacing our old trees with successors of the best modern type, thus keeping our cost of production fully competitive. We must also pursue with vigour adequate scientific efforts to make Natural rubber even more versatile than nature has done unaided, so that we may hold our own indefinitely in the highly competitive world we live in.

The demand for Natural rubber is quite healthy at a price which may be deemed satisfactory. Stocks, outside the Government stockpiles, are if anything on the low side, and, if fireworks can be avoided, the outlook seems to be encouraging.

The report and accounts were adopted.

SIR LINDSAY PARKINSON & CO.**IMPROVED RESULTS**

The 17th annual general meeting of Sir Lindsay Parkinson and Co., Ltd., was held on December 10 in London.

The following is an extract from the chairman's circulated statement:—

The Accounts for the year 1953 show that the Group Profit applicable to the Members of the Parent Company after Taxation amounted to £36,750 compared with £66,837 for 1952. The profit for 1952, however, included a credit of £181,593 not relating to the actual year's trading, and which item was fully explained in my statement last year. The corresponding credit in 1953 was £15,405. The Group Profit and Loss Balance carried forward amounts to £56,854, compared with £46,779 brought in.

The Parent Company's Accounts show a considerable improvement. The net profit for the year amounted to £128,344, as compared with £3,736 in 1952, and £3,953 in 1951. After providing for the Dividends for the year, the balance carried forward on the Parent Company's Profit and Loss Account amounts to £111,254, compared with £86,612 brought in.

Turning to the Consolidated Balance Sheet this shows a surplus of Current Assets over Current Liabilities and Provisions amounting to £782,364 compared with £237,407 last year. The corresponding surplus on the Parent Company's Balance Sheet is £398,427 compared with £247,078 last year. It will be observed that the total of the Capital and Reserves of the Group amount to £1,190,284 as compared with £1,059,828 for the previous year. The corresponding figures for the Parent Company are £1,148,552 compared with £1,092,404.

FOREIGN CONTRACTS

Australia.—The Australian Subsidiary Cos. have been engaged on Building and Civil Engineering contracts. Competition has become very keen in this market.

Canada.—The established business of our Subsidiary in Montreal is progressing favourably. Our Subsidiary Company in Toronto, after a slow beginning, is now securing an increasing volume of work, in what is a keenly competitive market.

Cyprus.—The First Phase of the Dekhelia Contract for the War Office is now almost completed, well up to time. Additional contracts in the Island have been secured and there seems to be adequate scope for further operations.

Gold Coast.—As Members will know, we have recently been successful in securing the contract for the construction of the new harbour at Tema, in the Gold Coast, West Africa, in association with Messrs. John Howard and Co. Ltd. The value of this contract is approximately £8,000,000, and it will take four years to complete.

British Guiana.—I am pleased to inform you that your Company has recently been awarded a contract for Drainage and Irrigation works by the Government of British Guiana. This contract is scheduled to last several years and is valued at over £1,000,000.

HOME CONTRACTS

Both our Civil Engineering and Building Departments continue to secure important contracts covering a wide field of Industrial and Public Service construction. In addition to several Housing Contracts for Government Departments, and Local Authorities, the Company is now once again building houses for private ownership, and we anticipate a continuing increase of this class of work.

The Board has already intimated that the Interim Dividends paid by the end of July, 1954, would be recommended as the total distributions for the year 1953, viz.:—On the 5 per cent Cumulative and Participating Preferred Ordinary Stock, 8 per cent less tax. On the Ordinary Stock, 10½ per cent less tax. These rates are the same as those paid for the previous year.

It is with the greatest regret that I record the death in November, 1953, of Mr. J. H. Lambert, who had been the Company's Legal Adviser for many years and a Director since 1945, and also of Mr. E. Parkinson in February, 1954. Mr. E. Parkinson had been connected with the business throughout his career, and had been a Director of the present Company since its incorporation in 1937. The Board has felt greatly the loss of two such valued colleagues.

The vacancies on the Board have been filled by the appointment of Mr. J. L. Parkinson, B.A., and Mr. A. W. Robinson. Both of these gentlemen have been in the service of the Company for many years and their appointment is a continuance of the policy of promoting to the Board employees who have proven their worth.

The report and accounts were adopted.

Mining Men and Matters

Mr. C. B. Anderson has been appointed a director of President Brand Gold Mining Company and President Steyn Gold Mining Company.

Mr. G. F. A. Burgess, chairman of the International Tin Research Council, has announced that, following the retirement at the end of this year of Mr. John Ireland, Dr. Ernest S. Hedges will become director of the International Tin Research Council and director of the Tin Research Institute. Dr. W. E. Hoare and Mr. W. R. Lewis have been appointed assistant directors.

Mr. F. R. Cottell and Sir Richard Snedden have been appointed directors of The Consolidated Gold Fields of South Africa and New Consolidated Gold Fields. Sir George S. Harvie-Watt, Bart., has been appointed deputy chairman of both companies.

Mr. R. C. Klugescheid has left the boards of Merriespruit (Orange Free State) Gold Mining Company and Virginia Orange Free State Gold Mining Company.

Mr. T. P. Stratten has been appointed a director of Western Holdings.

Mr. J. S. Walker has been appointed a director of Welkom Gold Mining Company.

Mr. Prain to speak at Royal Society of Arts. The Commonwealth Section of the Royal Society of Arts is holding a meeting at 5.15 p.m. on January 6 at which Mr. R. L. Prain will give the Henry Morley Lecture. Mr. Prain has chosen as his subject "The Copperbelt of Northern Rhodesia."

Aluminium (Canada) Ltd. vice Stand Ltd. Stand Limited have announced that as from December 6, 1954, the company will be known as Aluminium (Canada) Limited, which is the London correspondent for the Aluminium Limited Group of Companies.

Rubber Improvements Prize Essay Competition. Rubber Improvements Ltd. have announced a prize essay competition, open to everyone engaged in coal mining and to anyone interested in finding new applications for plastic materials. Entries from overseas sources are invited. Essays are to be submitted under the title "Present and Future Development of Plastics in the Mining Industry." Further details may be obtained on application to Rubber Improvements Ltd., Rilex Works, Wel-lingborough, Northants.

"The Economic Digest" have announced that their Editorial Office is now located at 47 Eaton Place, London, S.W.1. Telephone SLOane 7516.

We record with regret the death of Mr. E. J. Longyear, founder of E. J. Longyear Company of Minneapolis, United States. Mr. Longyear was a mining engineer of note and played a prominent role in the early development of the iron ores of the Mesabi Range. He superintended the first diamond drilling of the Mesabi Range in 1890. The company he founded, with its subsidiary companies, has traditionally supplied products and services pertaining to mineral exploration and foundation testing. Mr. Longyear was the author of an autobiographical sketch entitled *Mesabi Pioneer*, which dealt with the early history of the Mesabi Range.

BURMA MINES LIMITED

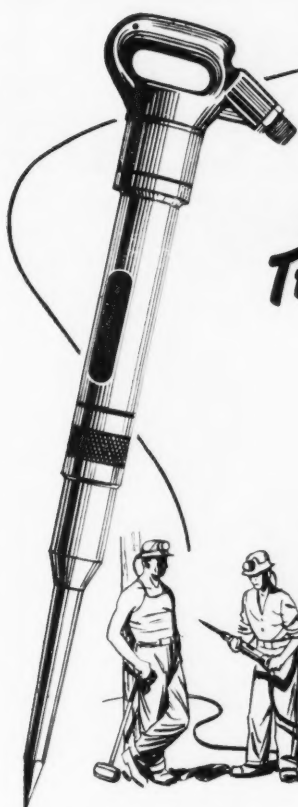
The following summarizes the Operating results of BURMA CORPORATION (1951) LIMITED (Incorporated in the Union of Burma and jointly owned by Burma Mines Limited and the Union Government) for the three months ended June 30, 1954, together with progressive details of Ore Extraction, Production and Estimated Revenue and Expenditure for the twelve months ended June 30, 1954.

The twelve months ended June 30, 1954.									
ORE EXTRACTION									
Quarter ended	September 30, 1953	..	..	..	..	..	..	17,800 tons	
Quarter ended	December 31, 1953	..	..	..	..	..	..	18,435 "	
Quarter ended	March 31, 1954	..	..	..	..	..	..	23,131 "	
Quarter ended	June 30, 1954	..	..	..	..	..	..	21,255 "	
								80,621 tons	
PRODUCTION									
Quarter Ended		Concentrating Ore Milled (tons)			Oz. Silver	Assays			
						% Lead	% Zinc		
September 30, 1953	..	..	..	19,406	13.04	15.843	12.577		
December 31, 1953	..	..	..	18,550	12.501	15.286	9.231		
March 31, 1954	..	..	..	23,698	12.503	15.196	9.941		
June 30, 1954	..	..	..	22,336	12.975	15.991	10.175		
Marketable Products were as follows :—									
Quarter Ended	Refined Lead Tons	Refined Antimonial Lead Tons	Refined and Doré Silver Fine Oz.	Copper Matte Tons	Nickel Speiss Tons	Zinc Concentrates 57% - 58% Zn. Tons			
September 30, 1953	2,188	1	124,914	59	—	2,799			
December 31, 1953	1,785	—	170,343	18	—	1,817			
March 31, 1954	2,290	95	303,317	53	150	2,487			
June 30, 1954	2,818	—	264,511	24	11	2,455			
	9,081	96	863,085	154	161	9,558			
ESTIMATED REVENUE AND EXPENDITURE									
				For Quarter ended June 30, 1954		For the twelve months ended June 30, 1954			
Estimated Gross Revenue (after adjustment of value of metal stocks)				K.71,92,100	£539,407	K.2,14,31,300		£1,607,347	
Estimated Operating Expenditure				K.47,83,300	£358,747	K.1,65,16,400		£1,238,730	
Estimated Operating Profit				K.24,08,800	£180,660	K.49,14,900		£368,617	
Estimated Taxation				K.7,60,000	£57,000	K.7,60,000		£57,000	
Estimated Depreciation on Machinery and Plant				K.1,53,900	£11,542	K.5,41,600		£40,620	
Capital Expenditure				K.3,68,700	£27,652	K.12,85,500		£96,412	

After deducting the foregoing estimates for Taxation and Depreciation the estimated Net Profit for the year is K.36,13,300 (£270,997) which compares with a Loss of K.26,44,633 (£198,348) for the previous twelve months.

Sales of pre-war stocks of Zinc Concentrates, made possible by the resumption of transport and marketing facilities, have made a substantial contribution to the financial results.

The Sterling figures shown are based on a Rate of Exchange of 1s. 6d. per Kyat.
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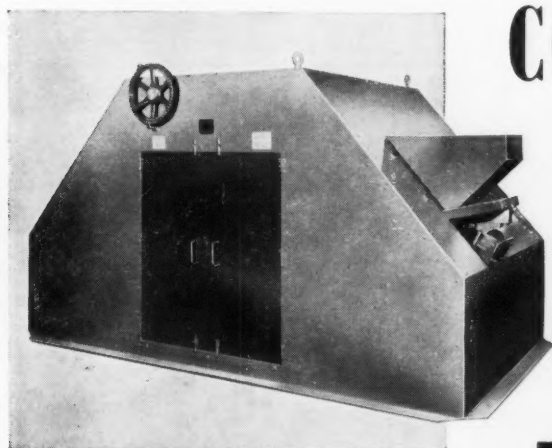
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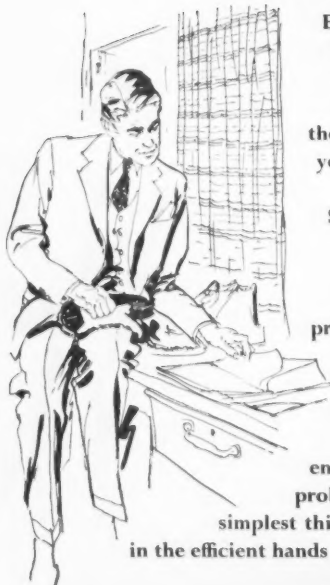
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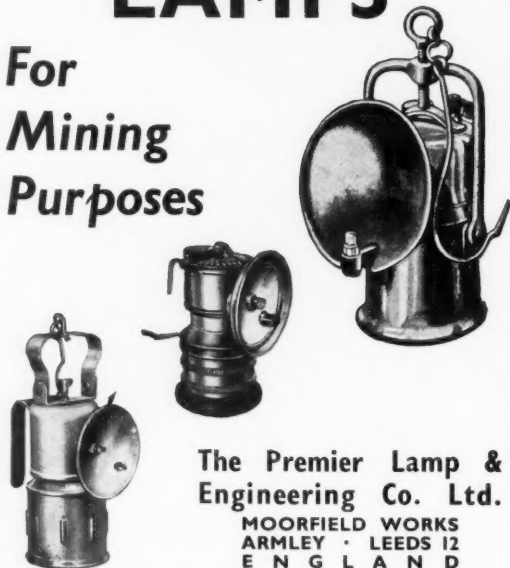


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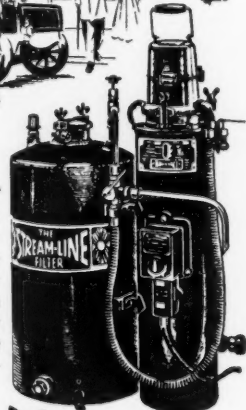
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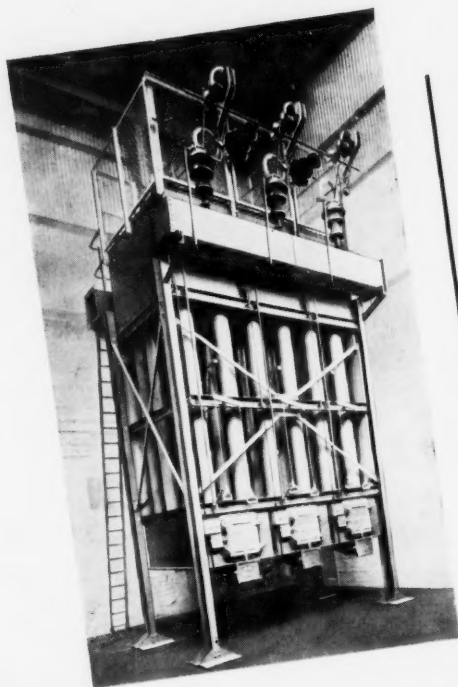
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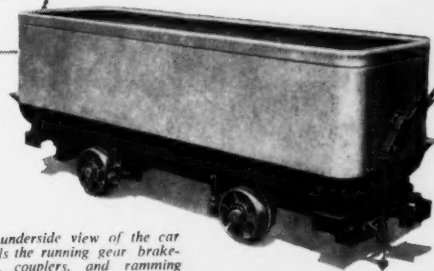
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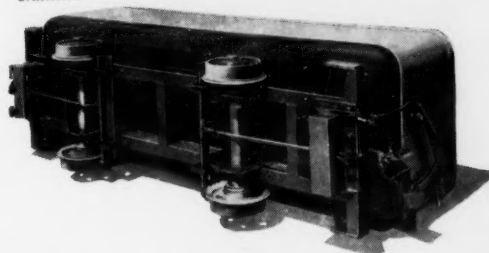
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